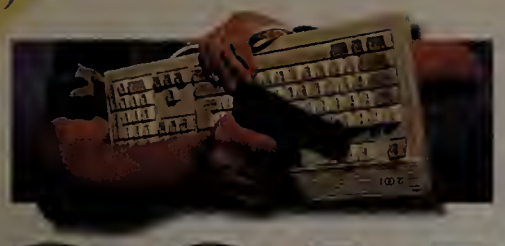


Cybercop boot camp

Where hacker catchers learn how to nail bad guys. **65**

Standing the heat

Firewalls hold up until humans get involved. **62**

COMPUTERWORLD

The World's Technology Newspaper
www.computerworld.com
September 7, 1998 • Vol. 32 • No. 36 • $4/Copy

Initiatives to power up Intel hardware

▸ *Clustering demos target scalability*

By Jaikumar Vijayan

THERE WILL BE plenty of hardware headroom for future application growth.

That's the message Intel Corp. and a handful of vendor partners are hoping to hammer home when they demonstrate a 3T-byte data warehouse running on a 16-node cluster of Intel servers at the Comdex Enterprise trade show in San Francisco this week.

In an industry-first event, Dell Computer Corp. will showcase 16 of its Windows NT-based servers using Intel Xeon quad-processor servers, tied together in a cluster. The cluster, running IBM's DB2 database

Clustering demos, page 96

▸ *Twin efforts push server performance*

By Jaikumar Vijayan and Stewart Deck

IBM LAST WEEK confirmed that it is working with Compaq Computer Corp. and Hewlett-Packard Co. on a PC specification that could mean much faster Intel-based servers.

The move could also create a rift between the industry's largest PC vendors and Intel Corp.

Separately, IBM confirmed that this week it will unveil its blueprint to migrate high-end server technology from its mainframe, RS/6000 and AS/400 lines to its NetFinity line of Windows NT servers.

The technologies — some of which IBM will start introduc-

Twin efforts, page 96

INSIDE THIS ISSUE

SELLING MORE SOAP
Procter & Gamble reorg expected to centralize IT. Page 4

Microsoft amnesia?
Justice Dept. slams Gates & Co. for 'nonanswers.' Page 8

WORD TO THE GROUPWISE
Users buoyed by enhancements to Novell groupware. Page 16

NEWSPAPER

ERP rentals lure users

By Julia King

COMPANIES DON'T build their own waterworks, electrical plants or telephone systems. So why should they construct and run thousands of individual enterprise software systems?

Information technology managers may need to come up with a good answer to that question as more vendors offer a new breed of service that lets users rent — rather than buy, install, customize and operate — name-brand software applications.

Under the new rental proposals, users wouldn't buy software

ERP rentals, page 97

COSTLY ALLIANCES

Merger lesson: IT targets often elusive

By Thomas Hoffman

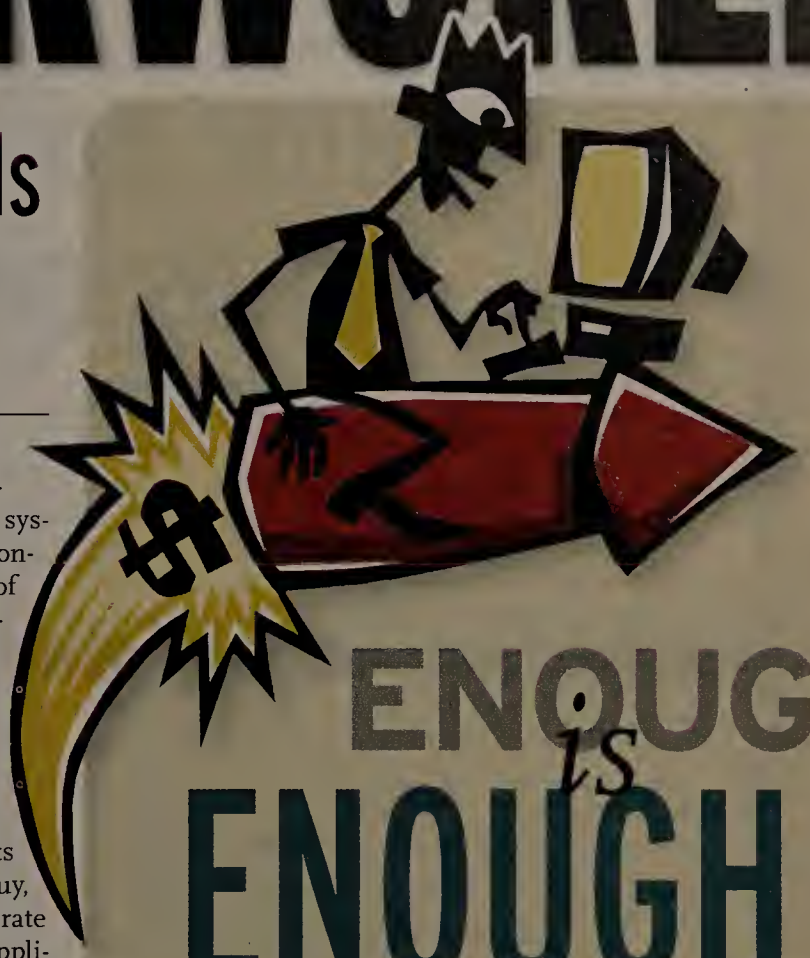
IT'S A FAMILIAR SCENE: Two CEOs from rival companies are photographed wearing Cheshire cat grins and shaking hands with each other as they announce a merger that's expected, among other things, to save millions of dollars and provide tangible business benefits by consolidating information technology.

Don't buy it. It turns out that few mergers hit their IT targets on time, if at all.

Take savings. On average, those IT savings targets "are off by at least 50%" of their original estimates, said Alan Gonchar, president of Compass America,

Merger, page 24

ILLUSTRATIONS BY VON R. GLITSCHKA



ENOUGH *is* ENOUGH

SPECIAL REPORT

The joyride is over. Corporate managers are putting the brakes on out-of-control salaries for IT professionals, according to *Computerworld*'s 12th Annual Salary Survey. Sure, some new hires still get sign-on bonuses, but last year's stratospheric pay raises have dropped to an ordinary 4% this year, in line with other occupations. And year-end bonuses have dropped for many IT pros, especially at the management level.

Managing, page 56

MEETING IN THE MIDDLE

Changes in compensation, including base salaries and bonuses, from 1997 to 1998:

JOB TITLE	COMPENSATION
CIO/VP of IS	Down $7,000
Director of networks	Down $1,900
LAN manager	Up $1,000
Senior programmer	Up $2,000
Database manager	Up $2,500

Note: All figures have been rounded off to the nearest hundred

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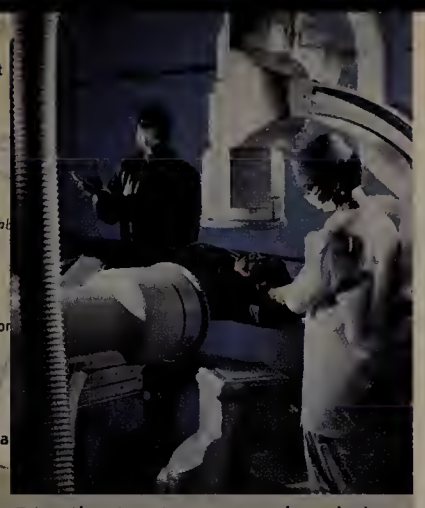
Unum Corp.'s Mark Harmon knows challenges for disabled IT pros, being paralyzed himself. **IT Careers, page 68**

'net connects native Canadian bands to speed building projects in a short season. **Internet Commerce, page 37**



Distributing inventory data helps GE Medical deliver parts anywhere in four hours. **Corporate Strategies, page 33**

In this issue

NEWS

4 **Auto group extends** network to makers of autos and parts in Europe and Japan.

6 **Economic downturns hurt** profits, tighten IT budgets, while staff costs rise.

8 **Microsoft denies** deleting damning documents, but deposition is contradictory.

10 **Oracle will unveil** database update with Internet-friendly multimedia file system, Java and easier management.

16 **Volvo drives** third-party used-car sales site with official support.

96 **Compaq will announce** this week two new laptops and enhancements to other models.

OPINION

12 **Peaceful tech shops disturb** Frank Hayes, who believes they're either complacent or out of control.

28 **Schoolmarm Maryfran Johnson** quizzes computer moguls about their summer, which turned out to be a hoot.

QUICKSTUDY

25 **XDSL:** Faster data transfer rates, but its rollout rate is slower than expected.

TECHNICAL SECTIONS

CORPORATE STRATEGIES

33 **GE Medical spreads** data strategically to distribute parts globally in four hours.

33 **Universities flock** to add courses on hot IT skills.

33 **Book portrays** Microsofties as connivers but sometimes hurts its own case.

INTERNET COMMERCE

37 **Dow flies** more efficiently with intranet to assign seats on corporate jets.

37 **Native Canadian** tribes link up to speed construction projects in remote Northwest.

THE ENTERPRISE NETWORK

41 **Cabletron finishes** one-stop-shopping pitch, following other router switch vendors.

41 **New tools manage** performance of SAP R/3 and other high-demand applications.

41 **Office product vendor empowers** salespeople by providing latest customer data in Notes on laptops.

SOFTWARE

45 **Microsoft boosts** support staff, gearing up for NT, Office and SQL releases.

45 **Free tool garners** corporate support for ability to tie complex apps, data to Web.

45 **CORBA succeeds** in some industries but lacks widespread users.

SERVERS & PCs

53 **British Petroleum tests** commercial software for global backup, seeing advantages over homegrown stuff, if it works.

53 **Vendors team** on products to put SAP R/3 software on a handheld.

FEATURES

MANAGING

56 **Salary increases slow**, our survey shows, reversing trend toward double-digit increases for techies.

IN DEPTH

65 **Would-be cybercops trek** to a California training camp to learn how to hack.

REVIEW CENTER

62 **Firewall challenge:** Three teams attack four leading packages and find they can take the heat.

IT CAREERS

68 **Disabled techs receive** equipment they need, but not the promotions they want.

70 **Check out** these Internet sites for good consulting and contracting resources.

ETC.

Company index ____ 95
Editorial/Letters ____ 28
How to contact CW ____ 95
Inside Lines ____ 98
Stock Ticker ____ 94

EXECUTIVE Briefing

News summary for senior managers

■Salaries for IT people are leveling off, according to our annual survey. Raises last year were in double figures; now they're closer to 4%. Bonuses are still going up for rank-and-file employees, but those at the top are often earning less. IS managers are trying to hold the salary line before it gets totally out of control. Page 56

■The Canadian government and native tribes are working to build an Internet-based network to connect remote villages — one at the end of 150 miles of gravel road — to government aid agencies. Among other things, they're trying to speed paperwork needed for grants that fund construction and other improvements. The players — including native-run Clan Raven Systems in Kamloop, British Columbia — want to make as much as possible happen in a construction season only five months long. Page 37

■Potential cybercops trek to boot camp to learn to hack Unix and Windows machines in order to track and attack hackers in their own environment. Cops are trying to keep up, developing investigative methods while mastering technology. They've got a few special tools, but the brain's more important in an environment where you can't see a badge and a gun doesn't work. Page 65

■GE Medical Systems is overhauling its inventory control system, parts of which are 15 years old, and converting to a system that stores data for its global inventory in three databases, each of which tracks parts in its own area of the world. Distributing the data speeds searches and helps the company aim for its goal of delivering anywhere within four hours. Page 33

■Think your intranet is cool? Dow Chemical's lets you reserve a spot on a corporate jet. It saves money, too. Page 37

■Office products manufacturer Essel helped its salespeople become more effective, with a Notes-based application that puts all recent customer activity in laptops that sales folk can take when they call on customers. Page 41

■Three years ago, the Canadian Imperial Bank of Commerce (CIBC) spun its 3,700-person IT staff into a separate company. Today, the company, Intria, provides IT services to CIBC, grocery store chains and oil companies. It recently sealed a deal with HP that it hopes will generate $1.2 billion selling financial and banking services in North America. Page 33

■Human resources and other paper-heavy corporate groups leaped on intranets as a way to ease information distribution. Now investor relations groups are doing the same thing on the Web, saving time for them and potential investors. Page 37

■Federal Express is spending more than $10 million on distributed databases and applications to boost customer service. Software made for net management will help track information about package dispatch and give quicker updates to customers. Page 14

Online this week

Year 2000 audit from Hell

New SEC rule raises issues, conflicts

COMPUTERWORLD
www.computerworld.com/more

Automakers eye global VPN

▸ *Promise of single, secure network essential to business functions*

By Bob Wallace

THE AUTOMOTIVE Industry Action Group (AIAG) is racing to extend the reach of its virtual private network (VPN) to automakers and their legions of suppliers in Europe and Japan, *Computerworld* has learned.

AIAG executives last week confirmed that they are working on a cooperative agreement with the European auto association Odette and are meeting with the Japanese Auto Manufacturers Association in an effort to make the VPN global.

If the deals are struck, automakers could exchange computer-aided design files, encrypted messages and electronic data interchange (EDI) transactions with their facilities and suppliers in Europe and Japan.

ONE FOR ALL

The Automotive Network Exchange (ANX) was designed to provide a single Internet-based network to support high-performance, secure and affordable communications between automakers and the thousands of suppliers that make up their supply chains.

The network currently is limited to the U.S. and Canada [CW, July 20].

"We're trying to make ANX a global network that the entire industry can take advantage of," said Don Hedeen, ANX director at the Troy, Mich.-based AIAG. "The next step is to work the Mexican connection."

The AIAG is headed in the right direction, one industry expert said. "International expansion is absolutely necessary to make ANX viable in the auto industry because every major company is a global player," said Tony Friscia, president of AMR Research, Inc., a Boston consultancy that specializes in supply-chain issues. "They all have global parts sourcing and distribution arrangements."

Expanding the ANX overseas would be a boon for U.S.-based automakers.

"There's the issue of international suppliers needing to get access to applications on servers back here in North America, where we need the flexibility to [support] ones on other continents," said Joe Boyd, a telecommunications analyst at Ford Motor Co. in Dearborn, Mich. An international ANX "would be very desirable to us."

WELL WIRED

The advantage of the VPN is that with one TCP/IP connection, a supplier can have simultaneous connections with multiple automakers, said Karl Schohl, ANX business manager at the AIAG. Today, suppliers need to have individual links to each automaker and the many companies that supply them with parts, which is an expensive proposition, he added.

So expensive, in fact, that one major auto supplier went without data connections between two of its plants.

"We just couldn't justify dedicated lines between two of our Ohio plants," said Paul Krikke, coordinator of information systems business applications at Taylor Steel, Inc. in Hamilton, Ontario. "But once they join ANX, they will have a private, affordable and secure network."

One of the first two trading partners on the ANX, Taylor Steel uses the network to handle heavy EDI traffic, secure E-mail, file transfers of digital photos and access to its suppliers' private World Wide Web sites, Krikke said. □

THE AUTOMOTIVE NETWORK EXCHANGE

Definition: A secure data communications network that links carmakers and their suppliers electronically over one multiprovider virtual private network

Benefits over traditional networks:

- Supports security and encryption over the 'net
- Uses Internet providers that have been certified for high performance and reliability
- Less expensive than dedicated data lines
- Lets participants use one connection to link to multiple companies at once

Source: Automotive Industry Action Group, Troy, Mich.

HP CEO mandates belt-tightening initiative

▸ *Cites poor performance in blunt speech*

By Jaikumar Vijayan

A MASSIVE cost-cutting exercise is under way at Hewlett-Packard Co., following a stern mid-August directive to employees from CEO Lewis Platt to put a lid on mounting expenses.

In a speech following the company's earnings announcement Aug. 17, an unusually blunt Platt warned employees that the company's performance was "unacceptable" and "won't turn around on its own" without drastic measures.

HP CEO Lewis Platt says the company's performance is "unacceptable" and "won't turn around on its own"

The expense cuts will make HP more competitive, "but I see no indication at all that it is going to result in a lesser [contact] with customers in terms of fewer sales calls" or support, said Vance McCarthy, editor at *HP World*, a publication of Interex, an independent HP user group in Sunnyvale, Calif.

Platt's speech has accelerated a sweeping internal review of expenses. Managers can fill jobs only deemed critical. Employees who could cater lunch meetings now will bring their own. Videoconferencing for meetings should take the place of travel where possible.

The cuts, however, will have no impact on HP's dealings with customers or the quality of service and support they are receiving from the company, said Marlene Somsak, an HP spokeswoman.

In late July, HP asked about 2,400 midtier managers to take a 5% pay cut and said it plans to close all U.S. offices for four days during the last week of December [CW, Aug. 3]. Platt's goal is to hammer down expenses to the point where there is at least a 10% spread between revenue growth and expense growth.

The cost-cutting moves make sense for HP, a company that has added about 4,800 workers in the past year, according to Technology Business Research, Inc. in Hampton, N.H.

WHAT IT TAKES

"[Platt] is really trying to shake up the organization and make them toe the expense line [when] the company's top-line growth is under all sorts of competitive pressures," said James Garden, an analyst at Technology Business Research.

Cost reduction may take some achieving but is absolutely crucial for HP if it is to regain momentum, Garden said.

In the last quarter, HP announced earnings of $621 million on revenue of $11 billion, compared with earnings of $617 million on revenue of $10.5 billion in the same quarter a year ago. Also last quarter, operating expenses grew by 6%, though revenue went up only 5%. □

Procter & Gamble growth push may centralize IT

By Robert L. Scheier

PROCTER & GAMBLE CO. is looking to supercharge its growth, and that could mean big changes for its IT organization.

In a drive to double its revenue to $70 billion within 10 years, executives at the Cincinnati-based maker of household products last week announced plans to abolish its current regional businesses and replace them with global organizations devoted to individual product areas.

That will likely mean major changes to back-end systems that track inventory, sales and costs regionally but now must track those same measures globally.

P&G's information technology staff also could be further centralized with the creation of the new Global Business Services organization.

The unit will provide the global product groups with common services such as payroll, human resources, order management and accounting, said spokesman Simon Denegrie.

The changes are part of P&G's Organization 2005 initiative, which was announced last week in a letter to shareholders from P&G Chairman and CEO John Pepper and President and Chief Operating Officer Durk Jager. Unlike a restructuring program that ended last year and was aimed mostly at cost cutting, P&G executives said they want the new initiative to drive growth, speed innovation and increase P&G's returns to shareholders. For the fiscal year ended June 30, P&G's net earnings grew 11% to $3.8 billion, but revenue grew only 4% to $37 billion.

UNCERTAIN TRACK

Denegrie said the Organization 2005 initiative might mean some job cuts but declined to say where they would fall or what impact the plan would have on P&G's IT group. He said further details will be announced in the next several weeks.

"They are going to strip out some layers of overhead and cost which, I think, will tend to centralize some of the IT functions," said Stephen Biciocchi, a partner in the consumer goods and retail national practice at CSC Consulting in Cleveland.

Even beyond the reorganization, P&G's IT staff can expect big challenges in the coming years as the company explores World Wide Web-based marketing and other basic changes to its business.

Biciocchi pointed to a summit of major advertisers called by P&G — the world's largest advertiser — last month to overcome obstacles to Web-based marketing [CW, Aug. 24]. □

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Economic crises pinch some IT budgets

▸ *Departments may see 5% spending cuts*

By Thomas Hoffman and Julia King

DESPITE THE negative impact that various global economic crises are expected to have on U.S. corporate earnings later this year, most information technology budgets should go unscathed.

Still, as profit margins get squeezed, some U.S. chief information officers are also starting to feel the pinch. "Some of our members [expect] there will be [IT] belt-tightening because of the 'Asian Flu,' " said Jim Jones, managing director of the Information Management Forum (IMF), an Atlanta-based association of IT and business executives from Fortune 1,000 companies.

For example, the depressed Asian markets mean that some of Burlington Northern Santa Fe Railway's biggest customers — the nation's grain companies — are expecting to export far less grain than usual.

Consequently, the railroad has decreased its revenue projections for 1999 and is tightening spending companywide. For IT, that means holding spending to 1998 levels of $170 million, excluding telecom expenses, said CIO Bruce Freeman.

The hardest-hit industries appear to be cyclical markets such as consumer packaged goods, high-tech and capital equipment makers. Although the U.S. economy has so far remained strong, troubled Asian countries have cut back on U.S.-made goods such as computers and industrial equipment.

BAD TIMING

Jones said that IMF members in industries such as consumer goods and business-to-business services expect their IT budgets to shrink roughly 5% compared with last year. That's bitter medicine for CIOs to swallow, as their divisions are already struggling to meet rising salary demands and jump-start projects postponed by year 2000 funding requirements such as enterprise resource planning.

Roberts Express' Joe Greulich expects recent market events to have little impact on his '99 IT budget

Moreover, rising contractor and internal labor costs mean CIOs "are going to get a lot less for their money in '99 than they got in '97 and '98," said Bob Buttacavoli, president and CEO of RCG Information Technology, a $250 million IT management consultancy in Edison, N.J. And demand for IT analysts is 300% greater than what IT can handle within that budget, according to Freeman.

Clearly, something will have to give. At Burlington Northern, that will be decided in the next few weeks by the company's executive committee. Since contractors comprise one-third of all IT workers, contractor rates and IT projects that are heavily staffed by contractors are expected to come under close scrutiny, Freeman said.

Still, some markets are relatively safe havens for IT spending. Big banks such as Citicorp in New York, which expects net income to be cut by $200 million because of Russian trading exposure, are diversified in so many investment areas that IT budgets should go relatively unscathed, analysts said.

CIOs whose companies aren't exposed to international currency problems say their budgets are stable. At Roberts Express Corp., an Akron, Ohio-based emergency freight shipper, CIO Joe Greulich's annual IT budget is tied tightly to overall sales.

And sales are good, as U.S. manufacturers continue to hum along despite wild fluctuations in the stock market, Greulich said. A big chunk of Roberts Express' business is delivering emergency parts and other materials to just-in-time manufacturers, such as the Big Three automakers.

"The U.S. economy — contrary to the stock market — is heating up, and manufacturers are manufacturing, so we've been very busy lately," said Greulich, who expects recent market events to have little impact on the company's IT budget for next year.

Meanwhile, the frenzied stock market activity should have a positive side for IT budgets at the Philadelphia Stock Exchange. "The markets are experiencing their highest volumes in history," said Frank Reidy, first vice president of the exchange's data center. Higher volumes mean increased revenue at the exchange "and that's good news for IT budgets," said Bruce Smith, chairman of the exchange's year 2000 task force. □

Managers asking IT staffers to aid recruiting

By Barb Cole-Gomolski

FACED WITH increased competition for talented technical people and corporate downsizing, some companies have started to involve information technology employees more heavily in the hiring process.

Hiring managers said that having technical staffers interview job applicants can help sway candidates who may be juggling multiple offers. Also, giving existing team members a vote in picking prospective colleagues may mean better working relationships.

Alta Software's Penny Jobin: Group interviewing "helps to sell the [applicant]"

Group interviewing "really helps to sell the [applicant] on the company," said Penny Jobin, a staffing manager at Alta Software, Inc., a Reston, Va.-based consultancy specializing in Java applications.

Jobin said that many of Alta's candidates are highly sought-after Java experts who want to do challenging work with the brightest people. Group interviews allow Alta to showcase its existing talent, she said. As a result of the peer interviewing method, about 90% of the job candidates accept their offers from Alta, she said.

At Alta, for example, a technical staff member such as a programmer may be asked to interview a candidate for a project-management job. The applicant also meets with the company's president and at least one project manager.

Each interviewer has an equal say on whether the person is hired, and each has full veto power.

Recruiters said group interviewing is on the rise, partly because so many companies have been downsized and thus have fewer middle managers to do the interviews.

At Inacom Corp., a systems integrator in Omaha, the opinions of the technical ranks are weighed heavily in the hiring decision, said Eva Fujan, vice president of technical recruiting. IT staffers provide a "technical screening" that human resources and even IT management couldn't do on their own, she said.

Laura Brumbaugh is an IT manager at Alta who participates in job interviews for a variety of positions about twice a month. She said she likes getting involved because there are "fewer surprises this way."

"We look at the person as someone we have to work with," Brumbaugh said. "When we do pick somebody, they tend to fit in really well."

At Winchester Hospital in Winchester, Mass., job applicants are often interviewed by potential peers and even subordinates, said Chief Information Officer Mike Gogola. "But it's not a democracy," Gogola said, meaning that some votes count more than others.

That may be a mistake, according to Jay Cogliano, CEO of Sullivan & Cogliano, an IT staffing and systems integration firm in Waltham, Mass. "It can create bad feelings if people don't think their vote counts," Cogliano said. "Our recommendation is that the group should reach a unanimous decision on hiring."

Another possible drawback is that IT staffers may be too busy to interview job candidates during regular work hours. At Alta, for instance, many peer interviews take place at dinners or on weekends. □

Job applicants finding fake credentials on the Web

By Barb Cole-Gomolski

RESUME FRAUD isn't new, but it seems to be more widespread at least partly because of the Web.

Information systems recruiters should look out for phony college degrees, transcripts and certifications that can be easily bought on the World Wide Web, according to Michael G. Kessler & Associates Ltd., a New York-based corporate investigation firm.

The firm recently wrapped up a six-month study in which 25% of the 1,000 resumes the company examined were fraudulent in some way. In many cases, the false claims were supported by fake documentation obtained via the Web. The resumes were provided by Kessler & Associates' clients.

The findings didn't surprise Jim Howard, a human resources manager for the information technology group at NationsBank in Atlanta. "[Resume] fraud and counterfeiting are not new, but they have gotten more sophisticated, thanks to technology," Howard said. He added that the bank "validates all claims" made on applicants' resumes to protect itself.

As part of the Kessler study, the firm inquired about buying a college degree on the Web and was flooded with responses and offers for software that outputs impressive-looking degrees. Certifications also may be at issue because Kessler found several Web sites that were willing to mail out gold-embossed certificates — in areas that included forensic dentistry, psychology and even fraud investigation — for a fee.

"It's clear to us that for as little as $150 you can become certified in just about anything on the Web," Kessler said. □

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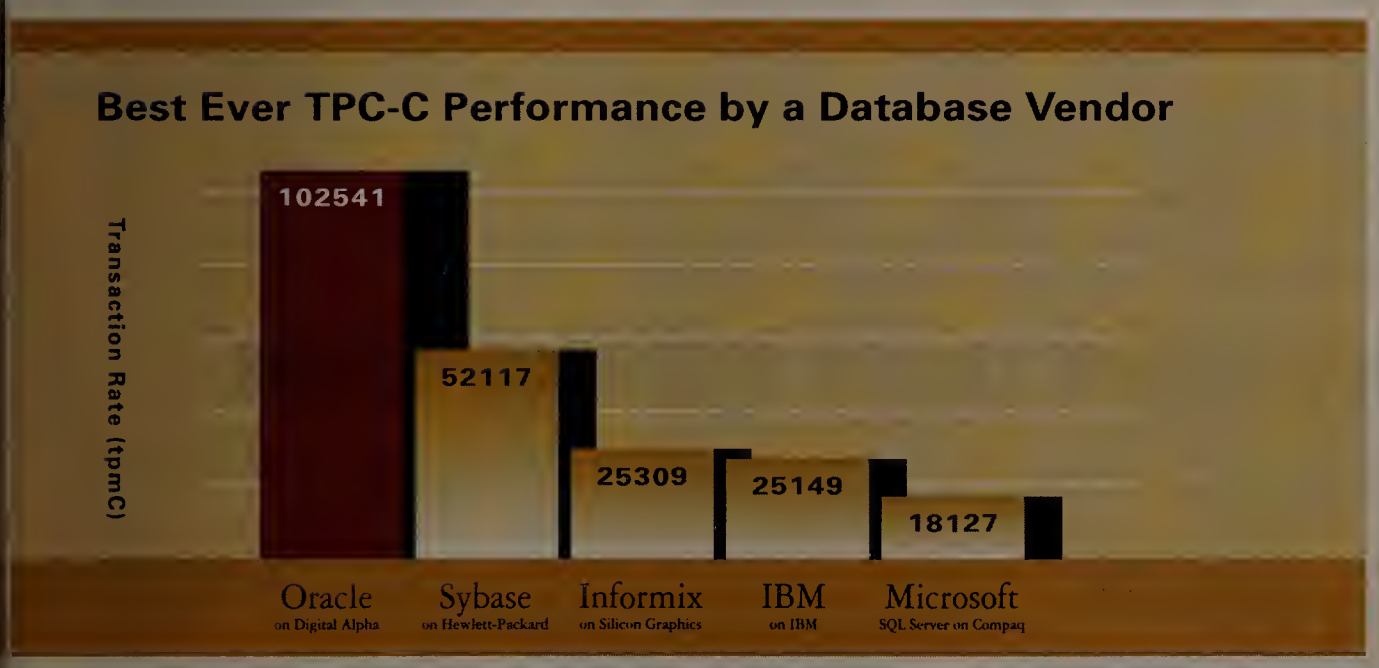

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Microsoft strategy is a risk

▸ *Company's 'Don't recall' replies to Justice Department are criticized*

By Sharon Gaudin

PLAYING DUMB about incriminating E-mails and documents is a dangerous strategy for Microsoft Corp. to pursue in its legal battle with the U.S. Department of Justice, according to antitrust experts.

The Justice Department, in a summary judgment motion it filed last week, accused Microsoft executives – including CEO Bill Gates — of having an "astonishing lack of recall" and of outright denial in the face of their own documents and E-mail. "Much of the evidence that Microsoft ignores comes from its own files," the Justice Department said in its filing. "Executives who are stated to be the author of documents claim not to remember writing them. Executives who are the stated recipients of documents claim not to remember receiving them."

Industry watchers say playing a game of "don't tell, don't remember" is going to be a tough one to win.

"This denial and lack of memory is going to look very foolish when you put it in front of the court," predicted attorney Gary Benton, a partner at the Palo Alto, Calif.-based Coudert Brothers, which specializes in antitrust litigation. "It's a fairly standard litigation tactic to say, I don't remember, but it's really foolhardy in this case. . . . The evidence that came out this week may well be the smoking gun the Justice Department has been waiting for all along."

'COOPERATIVE'

Microsoft denied that there was a case of overriding denial going on. "All of our executives have been very cooperative," said spokesman Jim Cullinan, who added that Gates can't be expected to remember specific E-mails from several years back when he gets 100 E-mails on a slow day. "We have answered every question to the best of our ability. The facts just don't support the government's case, so it's not surprising they don't want to hear the facts."

Hillard Sterling, a senior litigator specializing in antitrust and information technology at the Chicago law firm of Gordon & Glickson PC, said Microsoft executives might need to remember those documents because it might be in the company's interest to explain them.

"The judge is not fooled by significant lapses in memory," Sterling said. "E-mail documents are often the source of very hot evidence. The documents often speak for themselves and may require explanation to soften their impact. You need to explain negativity rather than ignore it."

Many of the Justice Department's sharpest remarks were shot directly at Gates, who has sat in deposition for the case.

"It's one thing to talk about Microsoft. It's another to talk about Bill Gates, who has managed to personify Microsoft in the way that John D. Rockefeller personified Standard Oil," said Harry First, a law professor specializing in antitrust at New York University.

The Justice Department's claims that Gates and other Microsoft executives are building a smoke screen around its case came as the two parties exchanged salvos with each other last week.

Late last week, U.S. District Judge Thomas Penfield Jackson ordered Microsoft to hand over documents the government requested in mid-August as part of its discovery process. The documents are related to Apple Computer, Inc., Intel Corp. and communications with PC makers regarding Apple's multimedia software, QuickTime.

The Justice Department claims that Microsoft illegally pressured Apple, Intel, RealNetworks, Inc. and Intuit Corp. in a bid to undermine new competing technology and hinder any competition.

"Microsoft's position is a bit distorted," Sterling said. "The Justice Department really is filling in the holes, rather than creating new theories. . . . It would be highly unusual for the court to find that the Justice Department has inappropriately expanded its complaint."

The judge also declined to rule on Microsoft's request to limit the scope of the Justice Department's case. He said that the issue would be taken up at the Sept. 17 pretrial conference.

Microsoft, meanwhile, accused the Justice Department of expanding the breadth of the lawsuit just weeks before the trial is set to begin on Sept. 23. The Justice Department argued that the information it presented last week isn't an expansion, but is supportive evidence of its main claim.

A Justice Department source who attended last Thursday's hearing said Jackson told Microsoft attorneys that his view of what the case is about isn't as narrow as Microsoft's. □

DUELING QUIPS

A sample of the barbs between the Department of Justice and Microsoft in recent court filings:

From the DOJ:

"When there is a claim that Microsoft does not want to deal with, it simply ignores it. … Much of the evidence that Microsoft ignores comes from its own files."

"Microsoft's CEO Bill Gates … displayed a particular failure of recollection at his deposition. … Mr. Gates' testimony appears to be part of a pattern of Microsoft attempting to rewrite history."

From Microsoft:

"… plaintiffs have gradually made clear their intention to broaden this case far beyond the 'surgical strike' they started out with."

"Plaintiffs are seeking to head down a path that would … transform this case into an IBM-like 'kitchen sink' monstrosity."

"Plaintiffs' efforts to shift the focus of this litigation dramatically on the eve of trial is 'too much, too late,' threatening to convert this proceeding into a trial by ambush."

Source: Court filings

CORRECTIONS

An Aug. 3 column, "Year 2000 costs: making sense of a senseless debate," misidentified an accounting organization that ruled on year 2000 costs. It is the Financial Accounting Standards Board. The article also should have said some parties had estimated the cost for year 2000 problem fixes could reach as high as $300 billion.

In the Aug. 10 Special Report on customer relations, the name of Boston-based Exchange Applications, Inc. was incorrectly listed as Valex. Valex is an Exchange Applications product.

A company name was spelled incorrectly in the August issue of Intranets, a supplement to *Computerworld*. The correct spelling is J&H/KVI.

An Aug. 10 Software section story, "HP preps Unix 9.x users for 2000," misidentified the time line for Hewlett-Packard Co.'s support for the HP-UX 9.x operating system. The company is discontinuing support for HP-UX 9.x after November.

In an Aug. 10 Opinion column, "IT hopefuls flock to a Silicon Valley job fair," Stephanie Buch's name was spelled incorrectly.

Caldera deposition raises evidence issues

By Sharon Gaudin

DID MICROSOFT CORP. destroy evidence supporting Caldera, Inc.'s claim that the software giant used predatory sales efforts to inhibit the sales of Caldera's DR DOS, a rival to MS DOS?

Red Herring Online published a story last week saying that a former Microsoft employee admitted to Caldera under oath that computer documents were destroyed in a Microsoft office during a federal investigation of that company.

In an interview with *Computerworld*, an attorney for Caldera confirmed that he deposed an "uncooperative" former Microsoft employee two weeks ago as part of Caldera's antitrust lawsuit against Microsoft.

"We consider Stefanie Reichel to be a key witness in our case now," said Steve Hill, an attorney at Snow, Christensen and Martineau in Salt Lake City. "I can't say what went on in the deposition, but it [supports] other evidence."

ATTEMPTED MURDER

Caldera filed a private antitrust suit against Microsoft in 1996, alleging that the company illegally tied Windows with its MS DOS operating system in an attempt to kill Caldera's competing DR DOS.

Caldera's suit also alleges that Microsoft introduced a bug in a beta version of Windows 3.1 that caused PCs to crash when the software was running on the same machine as DR DOS.

"We cannot discuss the content of any confidential deposition. We have provided more than a million documents and E-mails for the government and the Caldera issue," said Microsoft spokesman Jim Cullinan.

Hill said he can't comment on the information that came out of the deposition because of a protective order. Microsoft attorneys have 30 days from the day of the deposition to try to designate any of the information as confidential because it reveals business or trade secrets.

Hill characterized Reichel, who worked for Microsoft in Germany in 1992, as an "uncooperative" witness.

"Germany was a very important battleground between MS DOS and DR DOS in that period," Hill said. "DR DOS was offered by Vobis, the largest PC manufacturer in Germany, and Central Europe for that matter. It was probably the most significant DR DOS account. . . . They would help create demand for whatever products they offered."

Hill noted that in the 1992-1993 time frame, Vobis went from being a DR DOS account to a strictly MS DOS account.

He said Reichel was an account executive for Microsoft working on the Vobis account.

"If documents were extinguished during litigation, this raises clear issues of evidence tampering," said Hillard Sterling, a senior litigator who specializes in antitrust and information technology at Gordon & Glickson PC in Chicago. "The judge has the right and temperance to hand down severe sanctions for such practices."

Sterling also noted that if proved true, that information could play a role in the U.S. Department of Justice's antitrust case against Microsoft (see related story above). □

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Oracle to unveil 'net-friendly file system

By Stewart Deck

ORACLE CORP.'S database update, to be unveiled next week, features an Internet-friendly file system and capabilities users and analysts say may make the complex technology easier to handle.

Oracle8i will feature a new way to manage nonrelational data — such as images and text documents — called Internet File System (IFS), along with manageability features, Java capabilities and support for Extensible Markup Language.

"Focusing on electronic commerce and making [the database] more Internet-ready is a good idea as more applications move to Web-based capabilities," said Ed Leard, general manager of information systems at Yamaha Corp. of America, a Buena Vista, Calif.-based maker of audio/visual equipment, computer products and musical instruments.

Tom Witmer, IS director at North Arundel Hospital in Glen Burnie, Md., also said the new capabilities sounded interesting.

"It would be appealing to have the flexibility to generate some of our data models for use in the kind of architecture [Oracle] is describing," Witmer said.

The manageability aspects could move the database out of the hands of knowledgeable administrators and into the hands of more company users, said Mike Sun, an analyst at Giga Information Group in Norwalk, Conn.

Yamaha's Ed Leard says "focusing on electronic commerce and making [the database] Internet-ready is a good idea"

"If it works, it would take some of the mystique out of things and allow people to maintain more files outside of the database" while still giving them database-like access through a World Wide Web-browser interface, Sun said.

The Internet file system will let users store relational data and objects in the database, illustrating the overall data relationships in a user-friendly files-and-folders system.

That way, users can quickly access data as if it were being kept on a local drive, said Carl Olofson, an analyst at International Data Corp., a Framingham, Mass.-based research group and a sister company to *Computerworld*. "In effect, it can act as a file server replacement," Olofson said.

JAVA SUPPORT

Olofson explained that Oracle8i will also support Java within the database kernel so it can function as a Java application server. Users will be able to write Java applets, store them in the database and then execute them as JavaBeans.

Leard said he will wait to see if the new features add costs or cause a loss in speed. "A Web-enabled version of Oracle's applications cost us additional licensing and support fees," he said, "so I'll wait to see if Oracle8i involves any pain."

Hugh Allan, manager of information technology at Dunlop Tire Corp. in Amherst, N.Y., said his staff would look forward to learning more Java as part of the new system, "but from a business standpoint, the value of Java [in the database] is still a bit unclear."

Even if the latest Oracle release knocked his socks off, Allan said he probably still wouldn't purchase it right now.

"Year 2000 is just too big and taking so much of our attention," Allan said. "This makes it very difficult to even consider new products at this point." □

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FRANKLY SPEAKING

IS, IT: Breeds apart

FRANK HAYES

HEY YOU! Are you IS or IT?

Sound like a stupid question? It's not. IS and IT people are different breeds. And if your IS people aren't going nose-to-nose with your IT people on a regular basis, then something's wrong. Either you're missing opportunities or you're putting your whole company at risk.

Your IS — information systems — people are in the data processing business. Their main focus is on critical corporate information — processing it, storing it and keeping it secure. Your data center handles the transactions that are at the core of your company's business: collecting the money, paying the bills and generating the payroll.

Meanwhile, your IT — information technology — people have a completely different mandate. Their focus is on making users more effective out in the business units. Those are the folks who help salespeople sell more, make manufacturing more efficient and put product developers a step ahead of the competition.

Sure, they all work in the same department, your IS and IT people. But they'd better not be thinking the same way.

IS people are control freaks. They have good reason to be — the fate of the business is in their hands. They hate risk, and they hate anything that might threaten their systems and data. Given a choice, they'd gladly lock out all those pesky users who keep demanding more access to information — not because they hate users, but because every direct access puts the security and integrity of data at risk.

IS wants time-tested technology, but IT loves the thrill of the chase.

IT people are gonzo gamblers. They love new technology — the hotter the better. Is it untried, untested, unreliable? Great! That's the stuff that could pay off big — the technology that could blow away the competition. Sure, it's risky, but taking a chance is the only way to reap technology's biggest rewards.

IS people want well-understood, time-tested technology. IT people love the thrill of the chase, the raw smell of not-quite-ready-for-prime-time, betcha-can't-make-it-work products.

IS people want to keep data locked up and safe. IT people want data freely available, right now and all the time, to every user in your organization.

IS people know exactly what to do and how to do it — and they've been doing it for years. IT people know nothing — they depend on users to tell them what's needed for every new system and depend on their wits to master each new technology.

See what I mean? If those people are getting along, you've got a problem. Either your IS people are too lax with data integrity or your IT people aren't aggressive enough about giving users data access. Either your IS people aren't paranoid enough about untried technology or your IT people just aren't pushing the envelope the way they should.

Ah, you say, but our people aren't just IS or IT. They're well-rounded technology professionals. They understand the needs of both the data center and the users. They're the perfect blend, and we have the best of both worlds.

Baloney.

You *need* those two diametrically opposed forces in your shop. You need real champions for data security and real champions for user access — not just a bunch of wishy-washy chumps who "understand needs."

You need both protectors and adventurers, guardians and gamblers, real people who will stand up for what they believe in — even if that means a little more conflict and a lot more noise in your shop.

IS or IT? You'd better have both — and know who they are. It won't make your shop a happy, harmonious place. But it just might make the most of the people you've got. □

Hayes is Computerworld*'s staff columnist. His Internet address is frank_hayes@cw.com.*

SHORTS

SAP America CEO departs

Paul Wahl last week resigned as CEO of SAP America, Inc., the U.S. subsidiary of SAP AG, to become head of a Silicon Valley security start-up identified by industry sources as TriStrata Security, Inc. in Redwood Shores, Calif. Replacing Wahl at SAP America is Kevin McKay, who was the company's chief operating officer and chief financial officer. SAP America, which is based outside Philadelphia and handles R/3 sales in North and South America, accounts for more than 40% of SAP's worldwide business.

Wanted: Agent-friendly Web

Berners-Lee

The World Wide Web of the future should include machine-readable information so software agents can more easily comparison-shop or find a specific item anywhere on the Internet, according to Web inventor Tim Berners-Lee. Hypertext Markup Language (HTML) documents in the future could have portions designed just for automated software agents to read, eliminating the graphics and other frills agents must now work around to extract useful data, Berners-Lee said at an electronic-commerce conference in Boston last week.

Early year 2000 lawsuit fails

Santa Clara County, Calif., Superior Court Judge John Herlihy has thrown out a year 2000 class-action lawsuit filed against Mountain View, Calif.-based Intuit, Inc. on grounds that none of the plaintiffs have actually suffered problems. The lawsuit, filed in April on behalf of Quicken customers by consumer Alan Issokson, claimed that parts of Intuit's Quicken personal finance software won't work after Dec. 31, 1999. Herlihy dismissed the suit late last month.

'net fee is legal again

A U.S. District judge has ruled that part of the money collected for domain-name registrations can be used by a National Science Foundation (NSF) fund for Internet development and research. The money now totals more than $60 million. Judge Thomas Hogan initially ruled that sending $30 of each $100 domain-name registration fee to the NSF fund was an illegal tax. But after Congress passed a law authorizing collection of the money for that purpose, Hogan ruled that the fee is now legal. An appeal is expected.

Feds' year 2000 costs on rise

The federal Office of Management and Budget estimates the price tag for the government's year 2000 fixes at about $5.4 billion, up $400 million from the previous estimate three months ago. The latest quarterly report says about half of the government's mission-critical systems are fully compliant and more than 70% have been renovated. But the U.S. State Department was added to a list of six other agencies that are deemed to be making insufficient progress.

Cisco fixes firewall server

Cisco Systems, Inc. has confirmed a vulnerability in a server it ships with its popular Pix firewall that enables internal users to hack in to the Windows NT host and retrieve any files known to reside there. Cisco has shipped 10,000 Pix firewalls since 1995. A company spokesman said the vendor doesn't know how many users are vulnerable to the problem. Cisco is offering a free Pix Firewall Manager upgrade that provides a fix to all customers using the product. Subsequent releases of the product will include the fix.

CONTRACT OF THE WEEK

Customer: Cable & Wireless Communications PLC, London
Prime contractor: IBM
Terms: $3 billion, 10 years
Highlights: The information technology outsourcing megadeal will transfer 1,000 staffers from Cable & Wireless to IBM, and IBM will create up to 400 new jobs. Cable & Wireless will retain a small staff responsible for IT strategy, systems security and managing the IBM contract.

SHORT TAKES **Microsoft** has submitted electronic-wallet software for compliance testing for the Secure Electronic Transaction (SET) protocol, a move SET backers hope will add some momentum to the electronic-commerce standard. . . . **Lotus Development Corp.** last week unveiled a suite of tools that will let users link SAP R/3 applications to its Domino server. This week, Lotus will take the wraps off its Organizer 5.0 personal information manager, which lets users do calendaring and scheduling of tasks over the Internet. . . . **Caldera, Inc.** in Orem, Utah, has launched two wholly owned subsidiaries: Caldera Systems, Inc., to develop Linux products and services; and Caldera Thin Clients, Inc., to produce products for compact, embedded devices. . . . **Veritas Software Corp.** in Mountain View, Calif., has announced that it will acquire Calgary, Alberta-based **TeleBackup Systems, Inc.** in a stock swap valued at $80 million.

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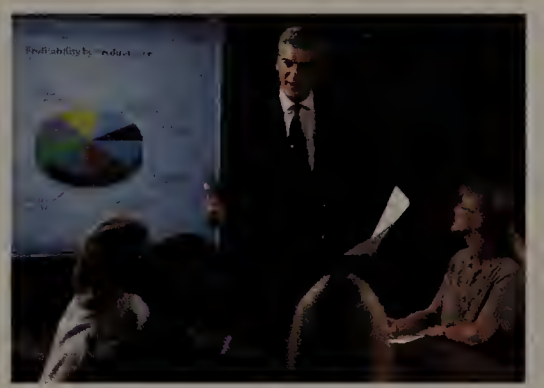

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SAP tries to ease the road to R/3

▸ *Users want more integration support*

By Craig Stedman
LOS ANGELES

MANY USERS are trying to make SAP R/3 a software sun around which other applications revolve, but getting to that part can still be a hard slog.

So SAP AG, pushed by buyers of its market-leading applications, is rushing to cut the complexity of linking homegrown and third-party software to R/3. At the company's TechEd '98 developers conference here last week, SAP announced several more steps aimed at making it easier for users to set up R/3 as an application backbone (see chart).

But many users in the throes of R/3 installations said they have yet to reach the promised land of easy integration.

For example, Farmland Industries, Inc., a $9.1 billion farmer-owned cooperative in Kansas City, Mo., found that most of the Business Application Programming Interfaces (BAPI) released by SAP during the past two years don't apply to the industry-specific version of R/3 it uses.

And Farmland, which sells a wide variety of farming, petroleum and food products, can't wait for SAP to write interfaces that match its bulk-commodity businesses. "We call ourselves an SAP-centric organization, but it's far from meeting all of our requirements," said Dick Weaver, technology manager for Farmland's petroleum and crop production units.

Weaver said he is looking at writing custom interfaces or relying on third-party application integration software to tie R/3 to Farmland's local cooperative systems and specialized applications, such as one that keeps track of oil field ownership interests.

SAP's integration support "is better than it used to be, that's for sure," said Karen Peterson, manager of business process planning at Lucent Technologies, Inc.'s power supply unit in Mesquite, Texas. "But they've got a long way to go in opening R/3 up."

The $1 billion Lucent division plans to go live with multiple R/3 modules next month and also wants to use the software as a backbone that holds a master set of data for non-SAP sales, planning and warehousing applications.

But SAP's interfaces "can be very, very slow" at passing along data, Peterson said. She added that Lucent also has run into some functional limitations: For example, special product configurations created with third-party software will have to be manually entered into R/3 for billing.

SAP executives at TechEd said that nearly 1,000 BAPIs will be available when R/3 4.5 goes into general release next year. That would more than double the number of programming interfaces that R/3 users and third-party software vendors can invoke to streamline their integration coding.

A half-dozen TechEd attendees said close ties between R/3 and non-SAP applications are expected to be a necessity for their companies.

For example, Weyerhaeuser Co. initially is installing R/3 just to run a piece of the processing workload for one of its business units, said Jerry Sams, manager of SAP quality assurance and testing at the $11.2 billion forest products company in Federal Way, Wash.

The need to link R/3 and other applications is a given, he said. □

R/3 TIE-INS

Integration-related announcements at SAP's TechEd '98 conference included the following:

- A set of plug-in R/3 interfaces for groupware, telephony and mobile computing applications
- Plans to use Extensible Markup Language to exchange data with non-SAP applications
- Support for R/3 programming interfaces in Microsoft and IBM development tools

MOREONLINE

For books, Web sites, FAQs, articles, newsgroups and mailing lists related to SAP, visit *Computerworld online*.

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FedEx taps software to manage databases

By Cynthia Bournellis

IN A WORLD where overnight delivery is the lifeblood of a carrier's existence, Federal Express Corp. doesn't take customer service lightly. And to provide a higher level of customer support, the Memphis-based delivery giant is investing millions of dollars to install distributed application and management software.

PROJECT UPDATE

Last week, FedEx signed a five-year contract with BMC Software, Inc. to standardize all of its domestic distributed application and database management using BMC products. BMC had previously supplied FedEx with mainframe database software.

The products (see chart) were designed to help information technology organizations improve business efficiencies and meet certain business goals. FedEx officials did say that the deal with BMC is the next major step toward helping the company manage and monitor the data that flows through its client/server system. They said the project will result in "huge" cost savings though they declined to give a figure.

The contract, which is worth more than $10 million, according to a source at BMC, is part of an ongoing strategy FedEx implemented three years ago to migrate a good chunk of its business processes from mainframes to distributed client/server systems.

As FedEx moved more data to distributed systems, it needed to take a look at certain processes and manage them. BMC's software will let FedEx manage and monitor information about packages, such as dispatch and tracking, and give quicker feedback to customers, said Tim Robertson, FedEx's manager of transaction software planning, who oversaw the BMC deal.

NO MORE OUTAGES

For example, FedEx will use BMC's Patrol Management Suite software to monitor the capacity of a server database and transmit the data to other systems running software from Hewlett-Packard Co. and Tivoli Systems, Inc. that serve as repositories for various metrics. That way, FedEx can avoid database outages, Robertson said.

Such outages could cost the carrier a lot of money. "We have two money-back guarantees, one for the package and one for the information about the package," Robertson said. "So it is important that we have this information available to customers" in real time.

BMC's software will also let FedEx better manage its Internet business. In its competition with Atlanta-based United Parcel Service of America, Inc. and others, FedEx is relying heavily on the Internet to reach and support its customers.

Overall, the company ships about $3 million worth of packages per day. Electronic processes amount to 58 million transmissions per day.

Though UPS is first in terms of revenue, FedEx is the industry leader in terms of service and is good at coming up with ways to make its business more cost effective while offering its clientele more services, said Jeffrey Pittsburg, an analyst at Goldis-Pittsburg Institutional Services in Garden City, N.Y. □

Federal Express will deploy three software products from BMC Software as part of a five-year, multimillion-dollar client/server implementation:

1. **Patrol Management Suite:** Monitoring and management tools that will serve as the foundation of FedEx's business-critical applications
2. **Replication Server Knowledge module:** Replicates data across various databases
3. **Change Manager:** Automates database structure changes, does data migration and controls versions

Spam tsunami wipes out 'Beach' Web site

By Laura DiDio

SOME TIME after operators of the Hit the Beach World Wide Web site left work the night of Aug. 28, spammers "tsunamied" it with hundreds of thousands of spam E-mails, eventually crashing it.

The mail was designed to bounce off the site and go to consumers, making it look as if Hit the Beach was the source, according to Beach Communications Group, Inc. President Ron Dubin.

Dubin said his first clue was a 4 a.m. phone call from a network administrator at an Arizona firm that had been spammed. He immediately shut down the Web server to stop the spam. After he restarted it, a flood of about 20,000 messages bouncing back from bad addresses brought it down again. An antispam filter on the site didn't recognize the bounce-backs as spam, Dubin said.

In response, operators of the travel and entertainment Web site have filed cease-and-desist orders against three firms that allegedly spammed the site: Alpha Online Communications, Inc. in Lancaster, Calif.; National Success Marketing, Inc. in Fort Lauderdale, Fla.; and Telysis Communications, Inc. in Columbia, S.C.

Patrick Tuminaro, who runs the Alpha Online Communications site, called the allegations "totally untrue."

Beach Communications discontinued free E-mail for its users and stopped running advertising. □

Netscape

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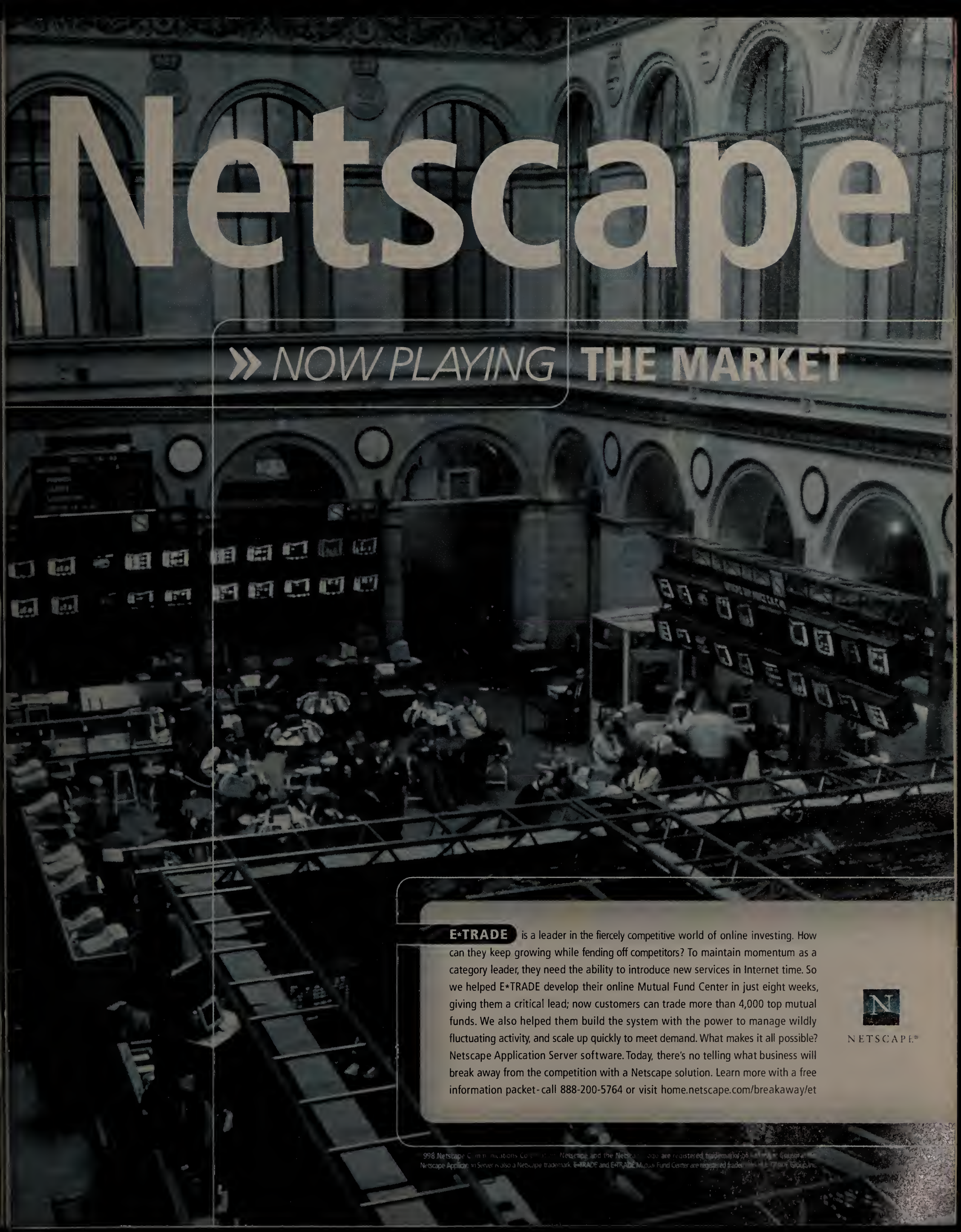

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Volvo turns to third party for Web sales

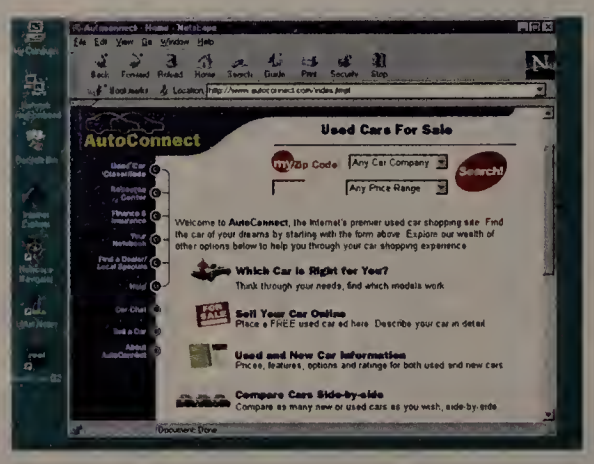
By Bob Wallace

IN A DEPARTURE from other automakers' strategies, Volvo has decided to use a third party's Web site to help its dealers sell used cars. The automaker plans to augment its use of the AutoConnect site with a homegrown Web-based used-car service due next spring.

Volvo Cars of North America, Inc.'s two-pronged World Wide Web strategy is an industry first. Other major automakers such as Ford Motor Co. are developing dealer referral services on their own Web home pages.

"It's an issue of reach," said North Holbrook, pre-owned car line manager at Rockleigh, N.J.-based Volvo. "AutoConnect's doing 400,000 hits per month, while our site's running at 45,000 to 50,000 hits a year." The automaker also will become the first to list all of its dealers' used cars on the Web.

"Another advantage they give us is their huge used-car search engine," which means buyers can find used Volvos at non-Volvo dealers that use AutoConnect, Holbrook said. AutoConnect also advertises extensively on the Internet, and when consumers type "used cars" into major search engines such as Yahoo, Inc. or Lycos, Inc., up comes AutoConnect with hyperlinks that can take them to the site, he added.



AutoConnect will help Volvo sell used cars

AutoConnect also lists used cars from some other automakers' dealers. Because of that, Volvo plans to post banner ads on the AutoConnect site so consumers will know of the jointly developed service, which will debut Oct. 1 as Volvo Select Pre-Owned. It also will reference the service on the Volvo site.

Volvo's strategy is a smart one, said Lincoln Merrihew, an auto industry analyst at J. D. Power & Associates, Inc. Luxury car leasing has created a higher used-car inventory for automakers such as Volvo than for those that also sell midrange and lower-priced cars, Merrihew said. "They need a broad audience, so they have to go with an en masse [Web] page," he said. "I've never seen an automaker put its entire used-car inventory up on another party's page."

With Volvo's planned Select Pre-Owned, consumers will access the AutoConnect Web site and enter "Volvo" and the specifics of the car they seek. That will prompt a search of the used-car inventory of an expected 280 dealers. A list of local dealers with the desired car will be displayed. The consumer can then click on an icon that will give more information about the dealer, including its E-mail address, and the car, including the asking price.

"Using Select Pre-Owned is bound to increase our sales volume and profits because it's an excellent and easy way for a customer to find a pre-owned Volvo," said Matt Brooks, sales manager at Kundert Volvo in Hasbrook Heights, N.J.

The second prong of Volvo's Internet-based effort for dealers calls for the automaker to launch a service — dubbed VolvoNet — to let consumers get detailed information about new and used cars from its North American home page (*www.volvo.com*) by next April, Holbrook said. □

Users give GroupWise 5.5 good marks

By Roberta Fusaro

INTERNET ENHANCEMENTS to GroupWise 5.5 go a long way toward improving the collaboration software and boosting faith in Novell, Inc., users said.

Provo, Utah-based Novell last week shipped Version 5.5 after nine months of beta testing. It features enhanced performance in several areas, including document management, calendaring and scheduling, World Wide Web publishing and Internet addressing for business-to-business collaboration.

Beta tester Mark Salandro, director of network services at Washington-based United Food and Commercial Workers International Union, said the organization will benefit from Version 5.5's improved document management features.

Specifically, users will gain default-sharing capabilities and the ability to mark 20 or 30 documents for mass sharing, instead of having to handle those documents individually, he said.

Dave Strickler, president of DWS, a systems integrator in Boston, said the Internet enhancements to GroupWise — a Simple Mail Transfer Protocol gateway, spam filtering and native addressing that's smart enough to distinguish between internal and external mail — will mean less irritating administration tasks for managers.

National Board of Medical Examiners' Stephen Lopez: Including workflow in the cost of the license is the biggest improvement

GroupWise will never monopolize the groupware market with rivals such as Lotus Development Corp.'s Notes and Microsoft Corp.'s Exchange, Strickler said. But he said Novell CEO Eric Schmidt's commitment to improving both GroupWise and NetWare is benefitting users and the company.

Compared with Notes and Exchange, Novell is still in third place in market share, analysts said. But it is a credible third, said Joyce Graff, an analyst at Gartner Group, Inc. in Stamford, Conn.

"GroupWise's WebAccess client continues to be the leader" among competitors, including Notes and Exchange, she said, because Novell was among the first to market with that technology. And the company reported a strong third quarter and has positive year-end projections, she said.

Stephen Lopez, director of telecommunications and network services at the National Board of Medical Examiners in Philadelphia, already has purchased the GroupWise 5.5 upgrade to replace several GroupWise 5.2 clients. The purchase will be made under the company's upgrade program, which trades an equal number of old and new licenses for just the cost of shipping and handling.

The product's biggest improvement, Lopez said, "is that now Novell has included the workflow piece as part of the [software] license" instead of charging extra.

"And they've straightened up a lot of things in [GroupWise 5.5], including . . . the calendaring and scheduling engine," he said. □

NDS for NT eases administration

By Laura DiDio

NOVELL, INC. LAST week released a version of NDS for NT that lets businesses manage far-flung Windows NT networks from corporate headquarters via Novell Directory Services.

Also, Novell and Citrix Systems, Inc. in Fort Lauderdale, Fla., announced they have brought NDS and Novell's ZenWorks desktop management tool to the world of thin clients. The vendors integrated NDS and ZenWorks with Citrix's WinFrame and MetaFrame thin-client networking software to make it easier to manage applications and user accounts.

The two announcements are expected to help technology managers reduce the total cost of network administration, users and analysts said. "Novell's biggest value is in the NDS directory, and the value just increased," said Tim Talbot, director of technology deployment at PHH Vehicle Management Services, Inc. in Hunt Valley, Md.

Version 2.0 of NDS for NT for the first time will allow administrators to manage remote Windows NT networks from a central console.

The previous 1.0 release required companies to authenticate users and files across the wide-area link, which was time-consuming and chewed up precious bandwidth, said Michael Simpson, Novell's NDS product manager. In the 2.0 release, "all authentication and management occurs locally," he said.

Talbot said NDS for NT has yielded a tangible return on investment (ROI) for his company. PHH can now deploy desktop changes, anywhere in the enterprise, at the click of a button from a central management console. "But the real ROI comes from the fact that our network administrators are now freed up to perform other tasks, and we haven't had to hire additional people to administer our Windows NT networks," Talbot said.

MOREONLINE

For resources on NDS for NT, visit *Computerworld online*.

www.computerworld.com/more

NDS for NT 2.0

Shipping: Expected by the fourth quarter

Price: To be determined

Comments: At the end of this month, Microsoft NT Server 4.0, Terminal Server Edition and MetaFrame users can get the updated Novell client for NT (Version 4.5) for free from Novell's Web site (*www.novell.com/download*)

Analysts said Novell's timely delivery of key directory services functionality, coupled with the absence of Microsoft Corp.'s Windows NT 5.0 and Active Directory, means NDS for NT is the best way to manage mixed NetWare and NT environments.

"This reaffirms the fact that users need both NetWare and NT Server," said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston. "The additional remote administration capabilities of NDS for NT 2.0 improves a product that's been doing very well since it began shipping last December."

Sakakeeny added, "The collaboration with Citrix is equally fascinating because it extends Novell's management reach into the thin-client area, where up until now, their participation has been minimal." □

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Microsoft backs feds' encryption standard

By Laura DiDio

IN A BID to catch up to rivals in the encrypted communications market, Microsoft Corp. last week said Windows NT will support government-mandated cryptographic standards by year's end.

"That's a 15-month delay," said Phillip Carden, an analyst at Renaissance Worldwide, Inc. in Hoboken, N.J., referring to Microsoft's announcement. The support may not ship until December.

The U.S. government had mandated that after June 1997, agencies and companies doing business with them acquire only encryption products that support the Federal Information Processing Standard (FIPS) 140-1 and FIPS-compliant standards, including Fortezza.

Microsoft will support the FIPS 140-1 and Fortezza cryptographic standards for government communications in Windows NT by year's end

- Both standards secure wide-area and Web communications and ensure the accuracy of the cryptographic implementation
- FIPS 140-1 secures software transmissions
- Fortezza locks down hardware with a portable cryptographic mechanism to secure communications

The National Institute of Standards and Technology (NIST) released FIPS 140-1 in June last year. It provides the framework for certifying cryptography implementations in software, whereas the older Fortezza standard specifies methods for implementing cryptography within hardware cards.

Microsoft will bundle support for the NIST's FIPS 140-1 and the Fortezza specification — which is part of the National Security Agency's Multilevel Information Systems Security Initiative — at no cost in Windows NT, according to Karan Khanna, Microsoft's Windows NT security product manager.

Rivals such as Netscape Communications Corp. and Entrust Technologies, Inc. have been shipping products that support FIPS 140-1 and Fortezza for secure wide-area networks and Internet communications since last year.

The June 1997 mandate that required all future government cryptography purchases to comply with the FIPS 140-1 standard came and went unnoticed by many federal agencies. Fifteen months have passed, though, and most are aware of the regulation and are complying.

For instance, Microsoft has lost out on at least one Department of Defense contract because NT, Internet Explorer and Internet Information Server don't support FIPS 140-1. Last fall, Netscape won a multimillion-dollar DOD contract, at least partly because it supports FIPS 140-1 across its suite of server products.

"That was . . . the first example of a federal customer taking the FIPS standard seriously in terms of purchasing and contracts," Carden said.

Microsoft does support the older Fortezza hardware-based cryptography standard in its Exchange and Outlook 98 messaging packages. That has let the software maker bid on contracts for the DOD's defense messaging system.

An added incentive for Microsoft to expand FIPS 140-1 support to its Windows NT and BackOffice suite of server products is that the American National Standards Institute is considering basing new cryptographic standards for financial institutions on FIPS 140-1. □

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Expanding Possibilities

Baan Institute rolls its own experts

By Barb Cole-Gomolski
HERNDON, VA.

THE BAAN CO., the Dutch enterprise resource planning (ERP) vendor, is getting into the business of finding experts to install its complex software and keep it running.

Through its new Baan Institute here, the company offers a combination of recruiting and training services for its customers.

Since it opened in June, the institute has been training workers for the company's own consulting division, but the Institute hopes to attract large consulting firms as well as companies that are implementing Baan software.

The institute is modeled after two similar facilities that Baan runs in the Netherlands and India.

Jason Hanold, director of national leadership and technology recruiting at Deloitte & Touche Consulting Group/ICS in New York, said leaning on a vendor for recruitment help could be an effective way to find entry-level consultants during the current information technology labor drought.

However, Hanold said he questioned whether Baan would be able to attract senior-level people — the kind he recruits. "The bar for hiring has become so high here," he said.

CUSTOMIZING

Many software companies offer training, and a lot have specialized training centers, analysts said. But Baan's approach is unique in that the company is taking on the task of finding individuals who it thinks will match a customer's needs. In addition, its curriculum blends business expertise with software skills and isn't limited to Baan software.

Anne Chamberlain, a principal at Buck Consultants in New York, said the Baan plan sounds like a viable approach to recruiting, but she cautioned that such a program should be carefully monitored by the enrollee's IT department.

"It raises issues," Chamberlain said. For example, "How are they assuring that the employees they recruit meet the standards of the [client] company?" she wondered. She also questioned whether recruits would be loyal to the hiring company over the long term, or whether they would feel some allegiance to Baan.

Brian Kellert, a recent business graduate of California State University at Chico, is about halfway through the junior consulting program at Baan Institute. Baan is paying his way, but the program would cost an employer $18,000. When he finishes, Kellert will work with a senior Baan consultant for several months before going out on his own.

"This class is almost like getting a master's degree" in ERP, said Joe Chiapeti, another student enrolled in the program. With demand so high for ERP experts, there are bound to be a lot of opportunities, said Chiapeti, who recently earned a business degree at the University of Wisconsin at Whitewater. The institute offers a senior consulting program for workers with significant industry experience, but little knowledge of BaanERP software. □

LEARNING BAAN

The Baan Institute's services:

- Will recruit and educate students in BaanERP and other vendors' products
- Offers a curriculum that combines technology and business skills

Users badly neglect desktop Y2K issues

By Thomas Hoffman

ALTHOUGH COMPANIES are plowing ahead with mainframe software repairs for year 2000, a new study finds that desktop repairs are lagging dangerously behind.

YEAR 2000

Although 65% of the 449 information systems executives surveyed said fixing desktop systems is critical to their businesses, 71% conceded that they have yet to launch a desktop compliance plan. The study was released Aug. 25 by the Cameron School of Business at the University of North Carolina at Wilmington. The poll was sponsored by Tangram Enterprise Solutions, Inc., a Cary, N.C.-based software vendor.

The survey found that 64% of the executives said they take inventory of desktop hardware and software no more than once a year. But poor asset management could torpedo the most well-intentioned year 2000 projects, an analyst said.

Because end users often upgrade hardware themselves and load unauthorized applications onto their PCs, most big companies "have a poor handle about what's on the desktop" and are underestimating their desktop compliance costs, said Stephanie Moore, an analyst at Giga Information Group in Norwalk, Conn.

Moore estimated the average cost of making desktops year 2000-compliant at $300 to $700 per machine, depending on whether hardware and memory upgrades are required. She recommended that companies keep a desktop systems inventory that is monitored and updated daily, not just annually.

Moore said several vendors offer products that automatically track hardware and software assets for year 2000 projects, including Tangram, Viasoft, Inc. in Phoenix and Pinpoint Software Corp. in San Jose, Calif.

But inventory management can be a thorny issue for shops that have done a lot of in-house software development. "That can be a problem because you never know what applications are installed" and what has been customized, said Mike Skiles, a year 2000 project leader at Eli Lilly & Co.

The Indianapolis-based pharmaceutical company conducted a desktop hardware inventory in 1996, followed by a check of its PC software last year.

Pittsburgh-based Dollar Bank, with $2.8 billion in assets, is attacking the desktop issue by physically testing each of its 1,000 laptops, teller terminals and PCs to make sure the hardware is year 2000-compliant, said Abraham Nader, senior vice president of IS. Among other tools, the bank tests desktop BIOS systems with freeware downloaded from the Internet (*www.nstl.com/html/ymark2000.html*). □

FALLING BEHIND ON YEAR 2000

- **30%** of companies don't track hardware or software inventories at all, and **64%** of companies do so only once a year
- **68%** of executives said their inventory tracking process can't detect software that isn't year 2000-compliant
- **65%** haven't begun to calculate the costs of correcting noncompliant desktops

Base: Survey of 449 senior IS executives

Source: Cameron School of Business at the University of North Carolina at Wilmington, sponsored by Tangram Enterprise Solutions, Inc., Cary, N.C.

IBM may sell network, keep service

By Jaikumar Vijayan and Bob Wallace

IF IBM does indeed sell its Global Network operations, as was widely reported last week, any impact is going to be felt more by smaller customers than by the larger ones.

That's because IBM hopes to sell its network infrastructure and retain the value-added services, according to a source familiar with IBM's plans.

As a result, IBM network customers will receive the same services, but the network may belong to someone else.

Another reason large users should see little change is that any company that buys IBM's network operations unit will want to keep IBM's largest customers happy, said Lisa Pierce, an analyst at Giga Information Group in Cambridge, Mass.

"Customers who have been very important to IBM are going to be equally important to any bidder," Pierce said.

For most customers, any disruptions would be relatively minor, said Craig Johnson, an analyst at PITA Group in Portland, Ore. Customers who use IBM's network for basic connectivity can get that service from anyone else, he said.

IBM's 6,000-person Global Network operation is part of the company's highly profitable services business. The Global Network transmits business data for an estimated 45,000 corporate customers and 1 million individuals and small and midsize businesses in 900 cities in more than 100 countries. The sale could net IBM up to $4 billion, according to some estimates.

For most users, any disruptions would be minor, said PITA Group's Craig Johnson.

Apart from providing the underlying network infrastructure, the unit also offers value-added services, ranging from connectivity to Lotus Notes deployment, electronic commerce and network integration.

IBM last week didn't comment on reports of a sale of its Global Network business.

Not all customers are happy with IBM. One is leaving and said she would have preferred a different owner.

Julie Bridge, electronic-media manager at Personal Creations, a Chicago-based company that uses the IBM network to sell gifts, said her company has lost order information. She added that the service hosted on the network required much custom programming. "We're not going to miss them," she said.

Johnson said he doesn't think having an upset customer is unique to IBM, and he said he knows of no surveys that show that IBM has user problems. □

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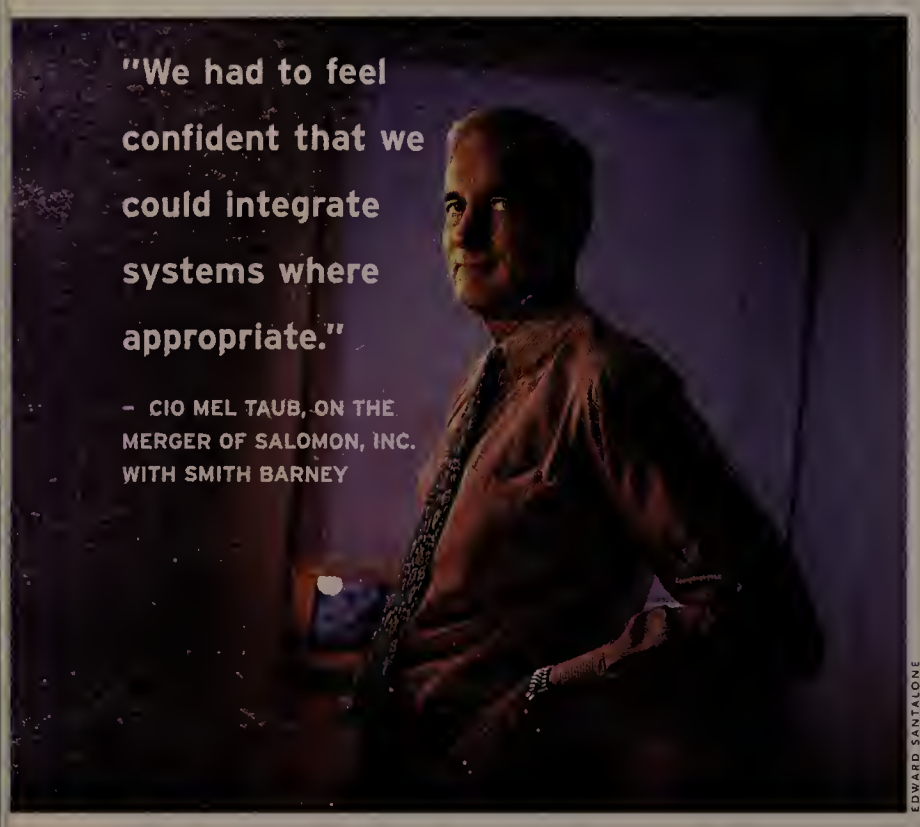
IT merger targets are elusive

CONTINUED FROM PAGE 1

Inc. Gonchar's Reston, Va.-based consulting firm has worked on a dozen mergers and acquisitions in North America during the past two years.

There are two reasons why IT cost-savings targets are so elusive in mergers, Gonchar said. Business units at the merging companies operate so differently from one another that economies of scale "just aren't possible," he said. And many partners fail to recognize that expected savings for consolidating big data centers start to disappear once companies pass the 4,000-MIPS threshold — about the size of Ford Motor Co.'s operation, Gonchar said.



EDWARD SANTALONE

SOME MISSTEPS

And so IT-related stumbles are common on the corporate merger road. Consider the following:

■ A 1995 merger between health care industry rivals Homedco Group and Abbey Healthcare Group has been a flop partly because of an effort to shift to a single computerized billing system, which led to billing errors that delayed payments from Medicare and other insurers. The merged company, Apria Healthcare Group, continues to post losses, and its market value has slid by more than $1 billion.

■ Executives behind the approximately $50 billion merger of Citicorp and Travelers Group, Inc. hope to leverage data mining applications to cross-sell investment, insurance and other products across each other's respective customer bases.

But sources close to Citicorp — including former IS executives — say the bank has struggled for years to share customer information across business lines, and analysts suspect that it may take close to 10 years for the new Citigroup to get its IS house in order [CW, April 13].

■ In January, two medical practice management companies called off a $6 billion merger announced last year because of different information technology approaches. MedPartners, Inc. in Birmingham, Ala. and PhyCor, Inc. in Nashville said they scuttled their plans after determining "significant operational and strategic differences" would prevent a smooth integration.

Merger experts also say there are political fights even after a merger is complete. Those battles often pit one IS organization against another in a turf war over which company's systems and staff will remain once the smoke has cleared.

"We see it with our clients, who become completely distracted by what system wins out and what system doesn't win out," said Kurt Cavano, a vice president who runs the corporate banking unit at American Management Systems, Inc. in New York.

Acquisitive banks that use technology effectively, such as Fleet Financial Group in Boston and First Union Corp. in Charlotte, N.C., consistently reach their cost-savings goals, said Nestor Zwyhun, chief technology officer of American Management's corporate banking unit.

But in most mergers, banks still running, say, four different loan and direct-deposit account systems from previous acquisitions can't meet their cost-savings goals because that "spaghetti maze" of systems is cost-prohibitive to support, Zwyhun said.

It's an even gloomier picture for merger participants in the manufacturing and service sectors. "There's a shocking lack of forethought given to the IT implications" going into most manufacturing mergers, said Michael Keating, a consultant at Arthur D. Little, Inc. in New York. Corporate merger teams typically look at products and markets going into a deal, "but they're not looking at [IS] infrastructure," Keating said.

It's only after a deal is struck "when they realize they've got incompatible data structures that require investments far beyond what their expectations were," he added.

But there are counter examples. GMAC Commercial Mortgage Co., a Horsham, Pa., division of General Motors Acceptance Corp. that offers mortgages to businesses such as hospitals and hotels, has used an aggressive acquisition strategy to help fuel its growth from 54 employees to about 1,200 in just four years. The company's mortgage portfolio has ballooned from $5 billion to $46 billion in the same span.

The IT group's integration plans cover everything down to individual PCs, said Niraj Patel, chief information officer at GMAC Commercial Mortgage. And the company's usual modus operandi is to simply replace anything it finds that doesn't conform to its standard hardware, software and networking setup. "We'll go in and rip the cabling apart if we have to," said Patel, who has managed eight acquisitions since early last year.

That approach was adopted after some early attempts at integrating different computing environments took longer and required up to 40% more labor resources than it would have to standardize platforms, Patel added (see story at right).

Observers said IT-related merger targets aren't met in part because CIOs are rarely included in pre-merger talks. One exception was Mel Taub, then the CIO at Smith Barney, Inc., who was asked by CEO James Dimon to review the potential IS compatibilities between the New York-based brokerage and Salomon, Inc., which Smith Barney parent Travelers acquired late last year for $9 billion.

"We had to feel confident that we could integrate systems where appropriate," said Taub, now CIO at Salomon Smith Barney. Taub said he found that both Smith Barney and Salomon were running Sun Microsystems, Inc. Unix systems on their front-end trading platforms and IBM mainframe systems to support the back office. "I saw no showstoppers," he said.

PRACTICE MAKES PERFECT

Acquisitive banks such as Fleet and First Union have created templates for consolidating information systems infrastructures from banks they purchase.

First Union has a straightforward game plan: shift all acquisitions onto First Union's computing platforms. That strategy has paid big dividends in the 80-plus acquisitions it has fielded since 1985.

For example, before First Union acquired Philadelphia-based CoreStates Financial Corp. in April, the monthly noninterest expense to run CoreStates was $137 million. Once First Union finishes merging CoreStates' systems in mid-November, the monthly tab to run CoreStates will drop to $98 million.

Though much of that savings will stem from plans to close about 100 branches, the consolidation of CoreStates' data center will snare $8 million to $10 million in monthly savings, said Austin Adams, executive vice president of First Union's automation group.

"We're able to reduce technology costs in the merged institution by 30% to 70% for each acquisition," Adams said. Technology, he added, "is the key enabler." □

Senior editor Craig Stedman contributed to this report.

Got the urge to merge? Call IT

Most acquisitive companies have created templates for integrating companies they acquire. Those often include SWAT teams of IS and business executives whose function is to oversee systems consolidation once a deal is approved.

"We go in from Day 1 of the talks," said Niraj Patel, CIO at GMAC Commercial Mortgage. "You could almost say IT is part of the [mergers and acquisitions] team." Before a deal gets finalized, Patel said his team gives corporate executives a projected budget for integrating the companies' technology.

First Union's strategy is simple: Move all acquisitions onto its computing platforms. "We don't maintain dual systems," said Austin Adams, executive vice president at the bank. "We do acquisitions to increase revenue or reduce expense . . . and technology is a key component in either one of those."

"You could almost say IT is part of the [mergers] team." – GMAC's Niraj Patel

One exception to that trend is Federal-Mogul Corp., a Southfield, Mich., automotive parts maker [CW, Aug. 24]. "We're not married to the information systems at Federal-Mogul," said Fred Kerns, the company's vice president of IT.

Federal-Mogul's four-point acquisition program includes the following:

- **Keep IT staff to support business functions (top issue in the first six to 12 months).**
- **Provide E-mail connectivity — you "must do this very quickly to get the combined organization in touch," Kerns said.**
- **Assess the year 2000 readiness of acquired companies.**
- **Take an IT inventory of the acquired company.**

One of the biggest challenges, Kerns said, "is where there's not complete [systems] commonality." The key, he said, "is to find opportunities for commonality," because you need a plan in place to move the company forward in the most efficient way.

— Thomas Hoffman, Bob Wallace and Craig Stedman

COMPUTERWORLD

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xDSL

DEFINITION: xDSL is a catch-all term for several types of digital subscriber line (DSL), a group of digital transport technologies. xDSL requires modems to send data over copper wire that's installed in nearly all businesses, making it a convenient and inexpensive transport medium. Asymmetric DSL (ADSL) is the flavor of DSL getting the most publicity because it allows telcos to install modems at either end of a copper connection in the local loop to boost bandwidth many times above the current 56K bit/sec. level.

Promising transfer technology going nowhere fast so far

By Matt Hamblen

THE DIGITAL SUBSCRIBER LINE (xDSL) technology promises faster data transfer speeds than traditional broadband technology, but users won't get the benefits unless xDSL is widely deployed, observers say. Traditional broadband technologies (which transmit via a single wire) include Integrated Services Digital Network, which features a transfer rate of 128K bit/sec., and analog dial-up, which depends on the speed of the modem — now as high as 56K bit/sec. xDSL has a transport rate of up to 8M bit/sec.

AT ISSUE

Lack of single standard hampers implementation

While xDSL has won a lot of publicity and interest in the past year, the technology hasn't made the headway analysts had expected. "I'm disappointed at the lack of xDSL deployment," says analyst Claudia Bacco at TeleChoice, Inc., a network and telecommunications consultancy in Dallas.

She says she's disappointed the telcos have taken so long to get this technology out to their customers.

Even though major voice and data carriers have announced that they're deploying xDSL in test markets, the adoption rate has been slow, analysts say.

There are several xDSL flavors, such as High-Bit-Rate Digital Subscriber Line technology and Asymmetric Digital Subscriber Line (ADSL), which is considered in the forefront (see chart.) Bacco believes telcos are being careful with ADSL because it lacks agreed-upon standards. More than 50 equipment vendors and carriers formed the Universal ADSL Working Group in February to develop standards by year's end.

TeleChoice's Claudia Bacco says she's "disappointed at the lack of xDSL deployment"

At that point, the market might pick up, Bacco says. "Especially on the business side, I don't see anyone [currently] using ADSL," says Shizue Davis, an analyst at Walsh-Lowe Constantine Group LLC in Hoboken, N.J.

Business customers are more interested in bringing new fiber-optic connections to their buildings than continuing to use an aging copper infrastructure that might break down or cause bad signals.

Fiber-optic technology is much faster, more rugged and requires less equipment. But if your building only has copper wiring, installing fiber-optic connections could mean you'd have to rewire parts of the structure. But copper wire is plagued with several problems including background noise — known as crosstalk — and instability during poor weather conditions.

Some equipment vendors, including Lucent Technologies, Inc. in Murray Hill, N.J., are encountering problems with xDSL, Davis says.

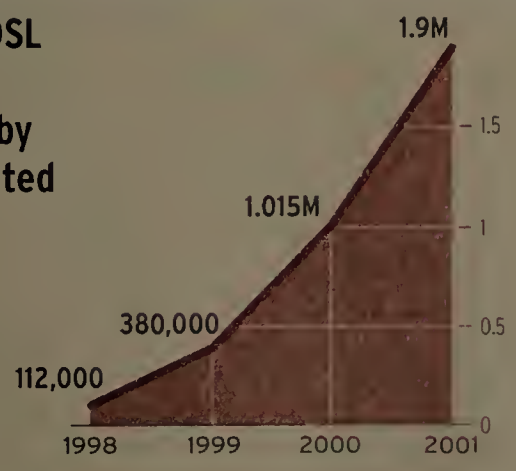
They have been reluctant to build modems for xDSL because they don't see the benefit in prolonging the use of copper when fiber is more versatile and resilient and will provide a revenue stream, Davis says. □

Spelling out xDSL

NAME	MEANING	DATA TRANSFER RATE	APPLICATIONS
DSL	Digital Subscriber Line	160K bit/sec. upstream and downstream	Dial-up communications
HDSL	High-Bit-Rate Digital Subscriber Line	1.544M to 2.048M bit/sec. upstream and downstream	WAN and LAN access for videoconferencing and to extend T1 lines
SDSL	Single Line Digital Subscriber Line	1.544M to 2.048M bit/sec. upstream and downstream	WAN and LAN access for videoconferencing
ADSL	Asymmetric Digital Subscriber Line	1.5M to 9M bit/sec. downstream; 16K to 640K bit/sec. upstream	Internet access and video on demand
RADSL	Rate Adaptive Asymmetric Digital Subscriber Line	1.5M to 9M bit/sec. downstream; 16K to 640K bit/sec. upstream	Service providers can adjust rate
VDSL	Very High Data Digital Subscriber Line	13M to 52M bit/sec. downstream; 1.5M to 2.3M bit/sec. upstream	Internet access and video on demand

Source: Walsh-Lowe Constantine Group LLP, Hoboken, N.J., and ADSL Forum

Total U.S. xDSL deployment projections by lines connected



Source: TeleChoice, Inc., Dallas

■ *Are there technologies or issues you would like to learn about in QuickStudy? Send your ideas to QuickStudy editor Stefanie McCann at* ***stefanie_mccann@cw.com***

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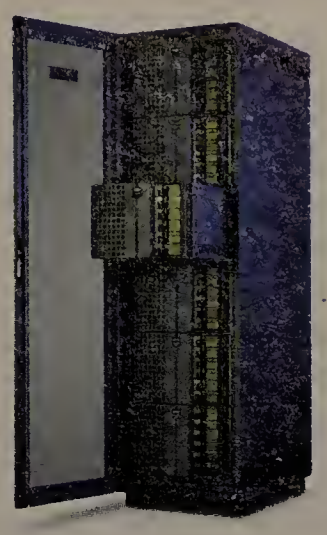

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OPINION

Pop quiz

OK, class, school's back in session. Let's settle down in our seats and review the summer of '98. Take out your PDAs and fire up a blank memo. I hope everyone brought extra batteries. (Yes, Mr. Jobs, you can use your little IMac, but please don't pester us with another demo.)

Let's start with that perennial favorite, the year 2000 problem. Can anyone tell me who's in charge now? That's right — the lawyers. (Please stop shrieking, Mr. Gates, we're not talking about those government lawyers.) Companies have been spending like drunken yuppies to fix all that code, IT budgets are booming, and there isn't an unemployed Cobol programmer on the planet. (Well yes, Mr. Palmer, I'm sure there are still lots of opportunities out there.)

Speaking of employment: How about those high-tech salaries? New IT grads are raking in $40,000-plus for starting pay, the really hot skills are coasting toward six-figure pay dirt, and any yahoo with an Internet start-up is driving a Ferrari to the bank. (Uh, someone lend Mr. Andreessen a tissue back there. He's sobbing out loud again.)

Who can tell me what corporate users were up to this summer? That's exactly right — they were busy throwing their weight around. One group was insisting SAP give them more say in R/3 developments. Another bunch was pushing Microsoft to support its user groups for a change.

Now, which operating system had the biggest bummer of a summer? Correct: Windows NT 5.0. That poor thing is late, overweight and as buggy as a swamp at sundown. (Mr. Ballmer, sit down! You've been warned about putting your classmates in headlocks.)

On the technology front, who remembers the summer's big news? All right, that was a trick question — there wasn't any. (Yes, Mr. McNealy, we know you can open your car door with your Java ring from here. But remember our rule about demos?)

OK, class, we're just about out of time. Let's finish up with a few readings from Mr. Amelio's book report on Apple. (Mr. Ellison! Did you just pull that fire alarm? Where's everybody going?)

Maryfran Johnson, *executive editor*
Internet: *maryfran_johnson@cw.com*

LETTERS

Mainframe skills *are* still in demand – and compensated

I WANT TO COMMENT on the letter from Jayant Chaudhary [" 'Cheap' foreign labor is doing just fine, thank you," CW, July 6]. He makes the statement that "... apart from year 2000 work, there is relatively little demand for mainframe skills."

Really? Then why is IBM selling more mainframe computers than ever? Why do firms like CBSI and Chubb Information Services have waiting lists for students in their classes that teach anachronistic subjects such as CICS, Cobol and MVS JCL?

Chaudhary seems to live in a particularly insulated little world — highly paid, no doubt — but not exactly the mainstream.

Perhaps mainframe skills are not as highly compensated as some of the sexier areas like SAP or PeopleSoft expertise. But I think there are a lot more mainframers than Chaudhary even imagines still gainfully employed and making a decent living out of it.

Why is IBM selling more mainframe computers than ever?

Geoff Wascher
Utica, Mich.
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Systems integration has wider impact than ever

JUST BECAUSE a Big Six vendor attempts to cross- or up-sell services in addition to needed system integration services doesn't mean that those services aren't needed ["Big integrators face backlash," CW, July 6].

Technology, with its increasing complexity, has had a greater impact on organizations and business processes than ever before.

Of all the systems integrations I have been involved with in the past five years, all but one have had a moderate-to-significant impact on organizations or their processes.

Software projects are not just software projects anymore.

Elizabeth Davidson
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Software developers should press for higher quality

FROM THE VERY beginning, Microsoft has delivered products that it knew was buggy [CW, "Microsoft hit with bug lawsuit," CW, June 29]. The company deliberately delivered shoddy merchandise in order to make a fast buck.

Software must be tested in accordance with the official software engineering quality assurance standards. Let us ask Microsoft to be more open in its testing methodology.

Remember when IBM was dominant in software? One good thing about IBM: We could trust its quality assurance.

We in the software development and user community must press for adherence to professional standards.

I hope that this suit filed in Louisiana is the beginning of a change for the better, for more responsibility by software developers.

Sanford Aranoff
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No more E-mail standards!

MICHAEL SCHRAGE'S column ["A way out of the E-mail morass," CW, June 29] about expecting to process "well over 100 E-mails per day," is an era that I've lived in for more than two years. Believe it or not, I actually prefer it this way. On a 12.5-hour shift, I delete closer to 200 than 100 messages a night. Yet I can prioritize most of the messages I receive by a glance at the sender and subject line.

The last thing I want to see is another E-mail "standard." I already have to do gymnastics whenever I'm sent a MIME (Multipurpose Internet Mail Extension) attachment, because the mail software my department uses doesn't know MIME.

Unless Schrage's prioritization is done by a line added to the mail header, I suspect it would just give me more messages I can't read. And however prioritization is set, spammers will use it to try to move their ads ahead of work-related mail.

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Computerworld welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Maryfran Johnson, Executive Editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Industry MagNuggets . . .

Joseph E. Maglitta

AT&T is quietly at work creating a multiuser, 3-D online mall. It's still early, but a key developer says the plan is to let multiple shoppers and storekeepers meet, haggle and do business in cyberspace.

The Jersey giant has hired a cutting-edge Bay Area design studio to work out the concept. Yes, Web malls are passe. But adding the third dimension . . . well, you never know. The big question, of course: Is there a virtual food court?

For almost two years, industry savants have knocked **Netscape's** zig-zagging plans. OK, so the company's bulk-up of Netcenter into a me-too portal site may or may not clobber **Yahoo**, **Lycos** and friends (which, by the by, were among the most-clobbered stocks in the recent Wall Street train wreck). But isn't this the kind of agility that business gurus say we all should demonstrate?

I'd like to take this opportunity to announce I am now a portal site.

Give 'em a break — at least for now.

They're no saps: German software juggernaut **SAP** plans to continue its relentless push into vertical markets (current total: 16). Next up, Co-chairman Henning Kagermann recently told *Computerworld*: steel, consulting and/or transportation. Keep an eye out for an upcoming roar by **Lion America Corp.** Stateside marketing heads have been spotted prowling trade shows, checking out competition for its notebooks and monitors. Besides tech gear, the company's Malaysian parent deals in everything from aquaculture to construction.

Dear Mr. Gates Dept.: Bad enough that it's reportedly easier to contact a lost relative via Ouija board than to get telephone tech support for **Windows 98**. But extorting $35 per call for "per-incident" support? Slide on over, Mr. McNealy and Mr. Barksdale. Shooting is scheduled to begin this month on a **TV pilot** of *Killer App*. The one-hour Fox drama about a Silicon Valley software start-up is written by **Garry ("Doonesbury") Trudeau** and directed by **Robert Altman**, the genius behind *Nashville* and *Short Cuts*.

I'd like to take this opportunity to announce I am now a **portal site**.

Crabby Traveler Dept., Part 1: If the Department of Justice wants to investigate a high-tech monopoly, how about hotel pay movies? It's On Command Video or snooze.

Crabby Traveler Dept., Part 2: Is it too much to ask for laptop power outlets on airplanes? Hurrahs: To **Delta** for offering PC power cords to the hoi polloi in economy class. Harrumphs: You have to buy your own cord for $89.

Neat things recently seen: Sony's chic, blueberry-hued **VAIO 505 SuperSlim** notebook — less than an inch thick, 2.9 pounds, with up to 266-MHz processors in a magnesium alloy case. Pricing starts at under $2,000.

Read it and bleep: *The Next World War*, by veteran defense journalist James Adams. Good news: Less battlefield fighting. Bad news: Wired society gets unplugged by cyberterrorism.

Chased by snarling Windows CE firms, **General Robotics' Palm III PDA** is so hot that parent **3Com** is building a new factory in Santa Clara, Calif., just to keep up. A memo to vendors: Normal people's fingers are bigger than a **Barbie** doll's.

Miss those **Intel** disco dancers in the clean-room suits? They're set to return this fall, according to the chip giant's ad agency. How about nominations for **All-Time Worst Computer Ad**? I'll get the ball rolling: Dom DeLuise pitching for a PC maker whose name mercifully escapes me — a pretty clear sign that the ad failed. E-mail me your worst candidate. □

Maglitta is Computerworld*'s industry editor. His Internet address is joseph_maglitta@cw.com.*

Tales of terror from the whipsaw stock market

Michael Schrage

The stock markets got kind of queasy last week. The Nasdaq — home of so many Web-alicious "New Economy" enterprises — endured most of the churning and burning.

Capitalism is a tough town, particularly when your options are gurgling under water.

Nobody can predict the stock market. If I had any special insights into buying high and selling low, I'd be writing investment columns and running a hedge fund instead of consorting with clients and writing about the collision of organizational and digital designs. But there's nothing like a "stockquake" to get organizations to re-examine some of their human capital assumptions.

Consider: a bunch of ambitious, aggressive young Internet/intranet companies discover their valuations are not only not going to hold steady, but they're also going to decline somewhere between 25% and 40%. To be sure, they are cash-flow-positive and growing at a double-digit clip. But for some strange reason, Wall Street rewards them with a measly 25 multiple instead of a 40 multiple. The horror! All of a sudden, all those hotshot GenX developers discover that their stock options are effectively worthless. They're working 70 hours a week for base pay and a lousy HMO membership. Does a "real" job suddenly have new appeal?

But wait, it gets worse! During the eight-year run of history's longest bull market — fueled in no small part by breakthroughs in software, silicon and networking — Fortune 1,000 mainstream geeks have finally begun to get the compensation packages they have so long and so richly deserved. Alas, a genuine recession hasn't kicked in, but profits will be much squishier than anticipated. The urgency to get ahead of the competition slackens just a bit. *Let's wait another six months before rolling out that new system.* Who do you think will be among the first white-collar workers to see their pay capped or cut? Ah, the irony: The software and network jockeys are finally making so much money that they'll have to take a hit when growth cools. Supply and demand cuts both ways.

Of course, the best of the digerati will have little trouble maintaining their lifestyles. But the B+ through C+ players who make up the bulk of the market and who have been the beneficiaries of the rising-tide-lifts-all-boats phenomenon may find themselves in the worst bargaining positions they've held in a decade. All that extra work being done under the rubric of year 2000 budgeting may shrivel in the harsh light of a nervous economy.

If your start-up's stock tanks, you're working 70 hours a week for base pay and a lousy HMO.

I make no claims to economic prognostication. But I have a pretty clear idea how IT folks want to be compensated these days and of how IT budgets have evolved these past three years. Those two elements weren't sustainable even in a growth economy. They certainly aren't sustainable in an economy in which technology is valued at healthy multiples instead of steroid-enhanced ones. I think Yahoo is terrific . . . but a $9 billion market cap? The bottom line is the bottom line: To the extent that the wind gets sucked out of high-tech sails/sales, there's gonna be a whole lotta job-hoppin' and compensation-freezin' going on. Don't think of things as getting worse — just don't think the next eight years will be as kind to the IT mainstream as the past eight were. □

Schrage is a research associate at the MIT Media Lab and author of No More Teams! *His Internet address is schrage@media.mit.edu.*

LAST YEAR, AMERICAN COMPANIES SPENT $320 BILLION ON INFORMATION TECHNOLOGY AND INCREASED PRODUCTIVITY BY 1.4%.

According to a Gartner Group study, one reason IT expectations rarely match projections is that untrained people use less than 25% of their applications. Which is why guaranteed training should be a critical part of any IT budget.

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An open mind beats a Big Idea

Allan E. Alter

Nothing's more dangerous in business than a stubborn executive with a Big Idea. Think of re-engineering, empowerment, total quality management and other ideas that start off promising and end up ridiculed in the Sunday funnies.

It *would* be a big joke if you didn't have to spend those Sundays on death-march projects, sacrificing your sanity and family life all because some grand poobah swallowed a panacea or absurd stretch goal whole, then shoved it down others' throats.

A study reveals that the best ways to implement decisions are participation and intervention.

There's got to be a better way to lead. A professor of management science at The Ohio State University by the name of Paul Nutt has found one. Nutt's theories are convincing and relevant because his research produced hard numbers and a third of his sample involved information systems. He isn't stumping for some Big New Idea, just pointing out proven techniques for finding good, implementable ideas.

Nutt studied four tactics that managers use to implement decisions. He defined a successful decision as one that was adopted and continued to be used for two years. His methodology looks strong: He studied business decisions at 376 organizations over 20 years and spoke with three executives involved with each decision. (You can look up the study in Volume 35, No. 2 of the *Journal of Management Studies*, published recently by Elsevier in the U.K.)

The two most common tactics were the least successful: issuing edicts ("Do it") and persuasion ("We've chosen this, here's why you should buy in"). Edicts work only 38% of the time; persuasion — the most common tactic — is successful less than half the time, according to Nutt.

That edicts fail is no surprise. We've all known a close-minded table whacker. But what's wrong with being persuasive? The trouble is, persuasion raises suspicions, Nutt says. People wonder what isn't being said, what's really going on.

What techniques work best? The two used less than 16% of the time: participation (80% success rate) and "intervention" (90%). With both, the boss meets with the people affected by the decision, explains the need for action, sets out the desired results and perhaps offers a suggestion. But — and here's the critical part, Nutt says — the leader makes it clear someone else's idea will be acted on if it gets those results.

Intervention involves an additional step. People are given information: actual performance (such as costs or service levels) and a reasonable expectation or norm to compare performance against (for instance, costs or service levels at comparable organizations).

The boss then asks staffers to identify feasible ways to close the gap. Intervention works better than participation, Nutt says, because focusing on the gap makes people take the problem seriously and keep the same goal and context in mind.

Intervention is subtle, which is why so few use it.

As for participation, "hardly anyone *really* does it," Nutt says. "It tends to be a token effort, involving just a few people. That is not effective."

Nutt isn't saying teams make the decisions. The boss should mull it over and make the call. "Reserve the power to say, 'This isn't good enough.' This is what makes someone a good manager, rather than a jellyfish or a despot," Nutt says.

Nutt's research shows it isn't a big idea, a big soapbox or a big stick that makes a leader effective. It's an open mind, open ears and open eyes. □

Alter is Computerworld*'s department editor, managing. His Internet address is allan_alter@cw.com.*

A modest proposal for Japan

David Moschella

World leaders continue to ponder the economic struggles of Japan and what, if anything, the Japanese government can do about them.

On that subject, I have one simple bit of advice: Japan should build the world's most advanced telecommunications infrastructure — and build it quickly.

It's obvious no one strategy can completely solve all of Japan's problems. But allow me a few paragraphs to explain why building the information infrastructure of the 21st century will do much more to put Japan back on the road to recovery than any set of consumer tax cuts, public works construction, financial manipulations or most of the other frequently proposed remedies.

The heart of the information revolution of the next decade will be based on communications bandwidth. Bandwidth is what will make services such as videoconferencing, online audio and video, multimedia information, electronic commerce and integrated voice/data services possible. Whether they realize it or not, nations already are in a race to build the advanced infrastructure needed for tomorrow's wired economy.

That's a race in which Japan is falling further and further behind. For reasons of language, culture and business inertia, Japanese use of the Web has yet to achieve critical mass. Bold action is needed to jump-start a system that might otherwise take years to catch fire. An all-out initiative to wire Japanese businesses, homes and schools with either fiber optics, coaxial cable or Digital Subscriber Line technology could change that dynamic dramatically. While the U.S. allows market forces eventually to sort out its own bandwidth challenges, Japan could surge into the lead.

If nothing else, such an effort would provide a badly needed boost for Japan's computer and communications vendors, which otherwise risk missing out on the network-centric boom. Those once-feared giants need a chance to deploy their skills, obtain firsthand experience and restore their somewhat tarnished global image. Certainly NTT, NEC, Fujitsu and others would jump at the chance to participate in such a world-leading project.

Similarly, Japan's mighty consumer electronics firms will need to find their own place in the network-enabled, digital markets of the future. Products such as cable set-top boxes, Web-enabled televisions and personal digital assistants will catch on first in countries with the necessary wired and wireless bandwidth. Additionally, the required labor and construction would be an important new source of jobs and training.

More important, once such an infrastructure is in place, Japanese business would surely find many innovative ways to use it. Given Japan's strong emphasis on face-to-face interactions, high-quality videoconferencing should have great business and consumer appeal, especially considering Japan's long commuting times.

The nation should build the world's best telecom infrastructure. Now.

Online audio, video and interactive games could revitalize consumer electronics spending. The possibilities for major innovations in health care, education and other social services are almost limitless, particularly if accompanied by a broad push toward real business deregulation.

Japan has a long and admirable tradition of responding effectively to new global challenges, especially when coupled with the idea of pursuing a national goal or mission.

Its business and policy leaders need to believe in the power of technology, then communicate that belief to the citizen at large. Technology alone didn't create the problems Japan faces today, and technology alone isn't the answer. But my guess is that it's the most direct path toward an effective and exciting solution. □

Moschella is an author, independent consultant and weekly columnist for Computerworld. *His Internet address is dmoschella@earthlink.net.*

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DEMAND TO SOAR

Number of IS professionals working in 1996 and projected to be working in 2006

JOB	PROFESSIONALS
Database administrators and computer support personnel	212,000 451,000
Systems analysts	506,000 1,025,000
Computer programmers	568,000 697,000

1996 2006

Source: U.S. Department of Labor's Bureau of Labor Statistics, Washington

Lucent chooses Optum

Lucent Technologies, Inc.'s Octel Messaging Division has purchased White Plains, N.Y.-based Optum, Inc.'s supply-chain execution software to manage worldwide shipments for its manufacturing and customer service operations in San Jose, Calif. Those operations, which support more than 100,000 customers, will integrate the Optum software with an Oracle Corp. enterprise resource planning system.

HTE serves utilities

Three utilities awarded contracts worth more than $2 million to HTE, Inc. for software and services to address deregulation and year 2000 issues. Placer County Water Agency in California selected HTE for increased budgeting capabilities because deregulation resulted in more rate variations. .Lake Mary, Fla.-based HTE also won contracts with Wilkinsburg-Penn Joint Water Board Authority in Pennsylvania and Polk County, Fla.

PC Docs makes sale

PC Docs Canada, a unit of PC Docs Group International, Inc., says the Canadian government has adopted PC Docs Open Enterprise Suite and CyberDocs products as key components of the national records, document, imaging and management systems.

GE parts data goes global

▸ *Splitting inventory info speeds delivery*

By Stewart Deck

GE MEDICAL SYSTEMS' 5,000 field service representatives phone into its call centers more than 1 million times per year. When ordering new medical equipment parts and checking on the status of orders, they don't want to sit on hold.

The company doesn't want them to wait even a few seconds longer than absolutely necessary. "Adding just 30 seconds to 1 million calls translates to an astronomical cost, so response time is critical for our system," said Ken Accardi, manager of the Global Service Management System division of GE Medical Systems, a Milwaukee-based division of General Electric Co.

GE Medical makes high-tech diagnostic imaging equipment including magnetic resonance, digital X-ray, computed tomography and ultrasound machines for hospitals and clinics around the world.

This fall, GE Medical will update its inventory and logistics system — parts of which are more than 15 years old — with a global version that keeps precise data about parts close to the parts themselves. The company will soon begin replacing its four logistics and inventory systems in North America, Europe, Japan and Singapore with a new system that will treat its worldwide inventory as a single global asset that can be moved around as needed.

GE Medical is implementing a global inventory system to keep track of components of high-tech diagnostic equipment such as this scanner

GE Medical, page 36

Hot tech skills hit campus

By Barb Cole-Gomolski

THE COURSE Michael Fontana just finished at Florida Atlantic University in Boca Raton was anything but purely academic: The 12-week boot camp on Oracle Corp. software was designed to prepare him for the Oracle certified database administrator test.

Meanwhile, Ron Adkins started working as an SAP AG R/3 administrator at Bay Networks, Inc. in Santa Clara, Calif., where he uses the SAP expertise he got while attending California State University at Chico. The school now offers five courses that incorporate SAP's enterprise resources planning system.

IN-DEMAND PRODUCTS

Across the country, universities are updating their information technology curricula to give students experience with in-demand software products. Software vendors are making it easy by offering schools free software, and business leaders are encouraging it because of the IT labor drought. The result is likely to be a better labor pool for employers and more lucrative offers for graduates.

For instance, students who

Hot skills, page 36

MAKING THE GRADE

School	Hot Skills Courses
California State University at Chico	ERP administration using SAP
University of California at Santa Barbara	Webmaster certification
Florida Atlantic University	Oracle database

• Book review

A look inside Microsoft

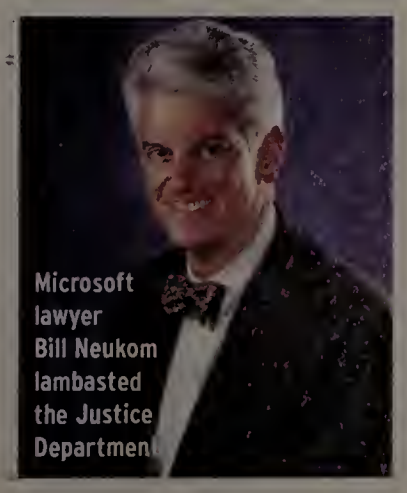
By Kim S. Nash

FIRST-CLASS CONNIVERS. That's technology reporter Wendy Golman Rohm's assessment of Bill Gates and his top executives. Rohm lays out her case in *The Microsoft File* (Times Books, New York, $25.95), due this week.

Rohm describes a Microsoft that is wily and willing to walk dangerously close to the legal edge — if not step past it — to win. The book is entertaining reading.

Rohm has covered technology for 10 years, writing for *The Boston Globe*, *Wired* and *Upside*, among other publications. But Rohm's writing sometimes gets in the way. At one point, Gates' head is described as sporting "seams of the skull traced like an etching across the crown

Book review, page 36



Microsoft lawyer Bill Neukom lambasted the Justice Department

Intria's growth exceeds all expectations

By Jaikumar Vijayan

WHEN INTRIA CORP. and Hewlett-Packard Co. formed a joint information technology services company in mid-August [CW, Aug. 24], it marked another step in the transformation of Intria from internal IT organization to independent services vendor.

Intria was formed about two years ago as an IT operation services spin-off from the Toronto-based Canadian Imperial Bank of Commerce (CIBC), which has assets totaling $282 billion.

Today, Intria, with $400 million in revenue, provides paper and electronic processing for telephone, PC banking, automated teller machines (ATM) and card services for a Canadian client list that includes CIBC, President's Choice Financial, Westcoast Energy, Inc. and HMV (U.K) Ltd.

Driving the decision to spin off IT operations at CIBC was the need to balance the cost of maintaining crucial backroom operations — such as check processing and PC banking services — against growing invest-

Intria, page 36

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Intria growth exceeds expectations

CONTINUED FROM PAGE 33

ment demands for new services and products, said Harriet Velazquez, president of Intria in Toronto.

Creating a new company has meant lower IT operation costs for CIBC and a chance for the bank to profitably use the years of experience it has amassed in the financial services area, Velazquez said.

"It's been pretty successful for us. . . . We have already sold more outside contracts than we had expected to by year five," she said.

The cost savings for CIBC is coming from the economies of scale and increased automation that Intria has been able to deliver through partnerships with companies such as HP, Velazquez said. For instance, apart from the HP partnership, Intria already has in place another joint venture called Intria Items, Inc. with Fiserve Solutions, Inc., a financial processing company in Canada. That teaming provides items-processing services such as check processing, statement and invoice handling and records and currency management.

The 750-person Intria/HP alliance, meanwhile, will provide mainframe and midrange systems management services, network operations support, ATM and point-of-sale system management and support, as well as desktop and LAN management.

Intria's main data centers in Toronto — which process more than 4.2 billion online transactions annually — are being linked with HP's operations services centers. The two partners will share management tools and practices, Velazquez said.

The company is among a handful of similar ventures set up by major corporations in a bid to turn costly internal IT organizations into profit centers, said Susan Scrupski, an analyst at ARC Consulting in Tinton, N.J.

LEVERAGE ASSETS

"What you are talking about here is outsourcing and commercializing an internal operation," Scrupski said. It results in "better economies of scale and a chance for companies to leverage their IT assets" profitably, she said.

But making such ventures work hasn't been easy. Examples of similar efforts include Transquest, a joint venture between Delta Air Lines, Inc. and AT&T Corp. in 1995 that failed with the breakup of AT&T last year, and the 10-year, $210 million outsourcing deal between Mutual of New York and Computer Sciences Corp., which failed because of disagreements on the scope and scale of services to be provided. □

Intria's Harriet Velazquez says the company has sold more contracts than expected

GE Medical

CONTINUED FROM PAGE 33

Much of the system uses a client/server module from RTS Software in Waltham, Mass., for logistics and inventory control. The RTS Stock module acts as the brain, choosing which warehouses the parts should come from. The RTS module will link to three Oracle Corp. Oracle8 databases in North America, Europe and Asia.

"We didn't feel like a single, distributed database would be robust enough to handle what we want it do with the speed we need," Accardi said, so each of the three will carry data about all of the parts in that region's physical warehouses.

"By architecting it with databases in each local region, we get the globalness of the system but without having a single global database and suffering the response time [lags] of that kind of setup," Accardi explained. The system will be able to respond to after-hours emergency calls — routing them to open call centers while still sending the parts orders to the proper region and warehouse.

CUSTOMER MAGNET

Michael Matty, a Wall Street analyst at Capital Reflections, Inc. in North Granby, Conn., said GE Medical could use the new setup to entice new customers and help retain current ones. Such systems do "tremendous things for users in terms of responsiveness and inventory control" and can help companies differentiate themselves from competition, Matty said.

Kurt Johnson, an analyst at Meta Group, Inc. in Stamford, Conn., said RTS Software has found a niche in companies with worldwide field-service forces. "RTS has concentrated on the details that are specifically unique to field service — parts inventory, scheduling, dispatching and mobile connectivity," Johnson said. "And they have a deeper focus on this than strictly call center or customer support center vendors."

"The goal of our logistics operation is to deliver any part anywhere in the world within four hours, without having lots of parts sitting around on shelves," Accardi said. "And RTS allows us to customize our business rules about where parts can come from." The first piece of the GE Medical system will come online in February, with final rollout expected to be completed in 18 months. □

Hot technology skills hitting college campuses

CONTINUED FROM PAGE 33

graduated from Chico in 1996 with degrees in operations management could expect to earn between $30,000 and $35,000, according to Ray Boykin, a professor in the department. However, a year later — after introducing the SAP software into several classes — graduates' salaries were creeping up into the $37,000-to-$43,000 range, according to Boykin. Adkins said the SAP experience boosted his job offers by about $15,000 each.

While students reap financial gains, schools also stand to benefit from improved reputations.

EMPLOYER DEMAND

Florida Atlantic got the idea to offer the Oracle classes after area employers approached professors seeking dozens of Oracle programmers. "There was a demand that we couldn't satisfy" for students certified in certain products, said IT Department Chairman Robert Cerveny. Though Florida Atlantic doesn't offer the certification exam, it offers the classes that prepare students for the test.

Fontana said taking the Oracle classes at Florida Atlantic for about $1,600 was far cheaper than it would have been if he had taken them directly from Oracle. He estimates that it could have cost $5,000 to $7,000 if he enrolled in classes run by the vendor. The lower price tag made it easier for Fontana to get his employer, a Coral Springs, Fla., marketing company, to pay for the classes, he said.

Laurie McCabe, an analyst at Summit Strategies, Inc. in Boston, said universities are smart to offer students the opportunity for hands-on experience with popular products. But she warned that product-specific classes "need to be taught within a broad context."

There is a danger that colleges could become too dependent on vendors and their products, McCabe said. However, some very prestigious schools — including Drexel University, Harvard Business School, University of Pennsylvania's Wharton School of Business and Purdue University — have joined SAP's America's University Alliance, which entitles them to free software to use in classes.

IT professors were agreed that schools need to adapt their curriculum carefully to avoid being viewed as training sites for vendors.

At Florida Atlantic, students can't use the Oracle courses as substitutes for courses required toward an IT degree.

"We are still universities, but we have to deliver the skill sets that are valuable to employers," Cerveny said. □

Book review: A look inside Gates' Microsoft

CONTINUED FROM PAGE 33

taut with the monotony of time." Uh, OK. I've never been quite that close to Gates, so I wouldn't know.

PURPLE PROSE

Parts of the manuscript were so wildly overwritten that they obscured the facts they were supposed to convey. Take this paragraph late in the story, which talks about how Joel Klein, assistant attorney general at the U.S. Department of Justice, pondered filing a lawsuit against Microsoft:

"It was October 20, 1997, and high time to prove to the world that this thing he [Klein] had stood up for — while [predecessor] Anne Bingaman had flailed her arms beside him like an ungovernable sapling — had teeth, and sharp teeth at that. Like some gleeful Cerberus, he was aiming the maw of the Justice Department's 1995 court order straight at Gates' trouser seat."

In other words, Klein apparently looked forward to suing Microsoft for allegedly violating a deal it had signed with the government in 1995.

Melodrama aside, the book does provide details of situations whose consequences are still playing out.

OBSERVATIONS

For example, Rohm observes the irony that Microsoft's top in-house lawyer, Bill Neukom, helped negotiate the 1995 pledge Microsoft signed not to tie any products to Windows 95. But when the Justice Department sued Microsoft last fall, charging that the vendor violated the pledge, Neukom publicly railed against the agency, saying it didn't understand the agreement or how the software industry works.

Although the public focus is on the Justice Department's antitrust case against Microsoft, much of the book focuses on the past, including Microsoft's ill-fated partnership to co-build the OS/2 operating system with IBM.

Overall, T*he Microsoft File* provides a nice insider's account of private meetings between Microsoft and various government officials, lawyers and industry executives. It's obvious Rohm interviewed many, many participants, some of whom are involved in today's legal wrangling. □

Internet Commerce

Extranets • The World Wide Web • Intranets

Briefs

SHOPPER PROFILE

Percentage of consumers willing to buy online

Men	33%
Women	21%
With college degree	32%
With postgraduate degree	43%

Base: Survey of 1,001 adults

Source: FreeRide Media LLC (www.freeride.com), New York

Internet rising

For the first time, half of all young American and Canadian adults (16 to 34 years old) are now Internet users, according to a study conducted by Nielsen Media Research in New York and CommerceNet in Palo Alto, Calif. Overall, there are 79 million Internet users who are 17 and older in the U.S. and Canada, a 36% rise compared with figures from last September. The survey, based on data from about 5,000 people in June, concluded that the number of people making purchases on the World Wide Web doubled.

Integration tool

MarketWave Corp. in Seattle has released Hit List Enterprise 4.0, a product designed to make it easier to incorporate Web site analysis and data mining into other corporate applications. It uses an architecture based on standards such as ActiveX and support for plug-ins. It also has support for databases created with Oracle software. Hot List costs $6,995.

HP's Web spinning

Hewlett-Packard Co. is expanding its Covision program to provide customers with a range of Web design capabilities, performance management and enhanced security. The Palo Alto, Calif.-based company added eight application vendors and four channel partners to a consortium of firms that offer customers a portfolio of Internet software and services.

Intranet smoothes Dow travel

By Thomas Hoffman

IN A BOW to the efficiencies of booking travel over the World Wide Web, The Dow Chemical Co. has built a reservation application for its intranet that lets employees reserve their own seats on the company's corporate jets.

The Dow Aviation Reservation (DAR) system is used by 5,000 employees to reserve seating on the seven company-owned planes that fly from the company's headquarters in Midland, Mich., to satellite offices in Shreveport and Baton Rouge, La. A fourth DAR route between Midland and Indianapolis is supported by chartered flights.

Reserving a seat takes one minute or less, one executive claimed, compared with 20 minutes through traditional channels.

Before the intranet system was phased in last July, Dow employees made reservations via the corporate aviation department, which went into an IBM CICS-based mainframe and reserved a seat on a flight.

If the desired flight was booked, the system person, trav-

Intranet, page 38

The Dow Chemical Co.

Challenge

▶ To improve the efficiency of an IBM CICS-based corporate aviation system used by 5,000 employees to schedule flights on company planes among three major facilities.*

Result

▶ Developed a self-service corporate intranet for about $50,000 that has cut the time it takes to make a reservation from 20 minutes to 1.

** Chartered flights go to a fourth facility*

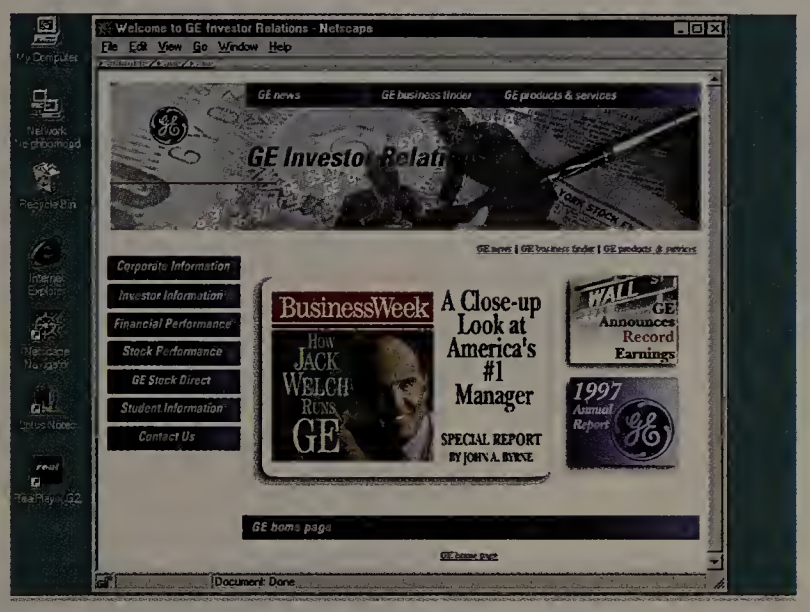
Web eases investor service

By Sharon Machlis

THE INTERNET has not only changed the way investors buy stock and track their portfolios, but it also is helping companies keep in better contact with their shareholders — at a lower cost.

Like human resources and other paper-intensive corporate groups, investor relations departments nationwide are joining the Web self-service trend, gathering and posting information investors are likely to want so they won't have to call the company as often.

"It's a cost-saver and a time-saver," said Sam Levenson, vice president of investor relations at Staples, Inc. in Westboro, Mass.



GE's site offers information about the company's GE Stock Direct program, which lets people purchase shares directly

Case in point: annual reports. Federal law requires that all shareholders receive paper copies by mail, but potential investors — not to mention students doing research — also want copies. The reports can cost several dollars a piece to print and mail, but an electronic version is essentially free. Staples has had thousands of hits on the link to its annual report.

"Nine times out of 10, the electronic copy is fine," said Sue Lorenz, manager of electronic communications at The Boeing Co. in Seattle.

Eighty-six percent of companies have an investor relations World Wide Web site, with another 10% planning one by year's end, according to a random survey of 2,500 corporate members of the National Investor Relations Institute in Vienna, Va., which includes 85%

Web, page 38

Canada hooks native tribes to Internet

▶ *Slow communications, expenses spark project*

By Carol Sliwa

WHEN YOUR construction season is only five months long, getting your documents for government funding processed in a timely fashion is essential to launching water, sewer and building projects.

"Once it hits 30 below, we don't do anything," said George Mouldo, executive director of the Gitksan Government Commission. "If we get late approval or a late contract, it will cost more and take longer."

That's one of the reasons Mouldo is looking forward to getting an Internet connection for his commission, which represents five bands, or tribes of Native Canadians, and three school districts in the northwestern section of British Columbia.

The government officials that Gitksan needs to deal with — whether in Ottawa; Vancouver, British Columbia; Victoria, British Columbia; or Edmonton, Alberta — are all far away.

And, when the Gitksan Government Commission queries Canadian officials in writing, it can take a month to get a paper-based response.

Cognizant of the need for timelier communications, the Canadian government is making up to $10,000 available to any of the country's 626 bands to become enabled for the electronic exchange of data relating to housing, population, social

Canada, page 38

INTERNET CONVERGENCE

Intranet

CONTINUED FROM PAGE 37

eler and traveler's secretary typically would swap calls to discuss other flights, placement on a waiting list or cancellations that popped up. "The main concern we had was saving man-hours and making reservations," said Norris Davidson, North American Aviation manager at Dow in Midland.

But the impetus for the intranet application came last April, when the corporate aviation department prepared to add four daily flights between Midland and Indianapolis and "didn't want to go through the costs of adding that to the IBM CICS system," said Bob Graham, a Dow technical leader in Plaquemine, La.

To date, most self-service applications on intranets have been human resources applications that let employees see and make changes to their benefits.

Davidson asked Graham's group to explore a Web-based system. Graham developed a rough prototype the following month and built a Web system to support the new route in six weeks. It went live in July 1997.

A typical reservation request on the mainframe took 20 minutes to complete by the time all the phone calls were made and passenger information was put into the system, Graham said. Now, employees can book their own flights using Web browsers in one minute or less, he said.

Davidson said he couldn't quantify the labor costs the self-service intranet has saved the company. But he said it is "almost unbelievable how the telephones stopped ringing" once the company shifted to a Web-based reservation system.

Davidson estimated it cost roughly $50,000 to build the self-service intranet. That cost included adding the other flight routes to the system a year ago and other newer features, such as an electronic billing function that allows the aviation group to automatically charge flights against an employee's account.

To date, most self-service applications on intranets have been human resources applications that let employees see and make changes to their benefits. To that end, most companies have opted to buy an off-the-shelf package rather than build their own as Dow did. Vendors in this area include Santa Clara, Calif.-based Edify Corp., said Sue Obijiski, an analyst at Gartner Group, Inc. in Stamford, Conn.

This fall, Dow plans to launch a pilot program aimed at supporting commercial flight reservations for senior executives, Davidson said. "I'm not a computer person, but I can recognize how tremendous this system has been for us," he said. □

Canada turns to the 'net

CONTINUED FROM PAGE 37

assistance, education and capital projects.

Paper reduction and data quality improvement will be added benefits, said Robert St. Germain, manager of corporate databases at British Columbia's Department of Indian Affairs and Northern Development (DIAND) unit, which works with the province's 197 bands. He said 95 have submitted applications for funding.

"By the time they provided us with the information and hard copy and it was inputted and processed, it was almost time for the next reporting period, so they never got any feedback," St. Germain said. "We're just trying to get into the 20th century."

The eventual goal is to streamline the system so that the data can be dumped directly into DIAND's databases for processing.

For some bands, the new initiative will mean getting a computer and sending information via diskette. For others, it will mean getting an Internet connection — and that's not always the simplest task in some of the more remote regions of Canada.

For instance, Takla Lake First Nation has 553 members in British Columbia: 255 don't live on the reserve; 298 do.

The band's financial center, in Prince George, British Columbia, will have no problem hooking in to the Internet because there are at least eight local providers in town, said Joe Bowers, the group's accountant and manager.

But some Takla Lake members live about 350 miles to the northwest, in a logging community served by a road that is rough gravel for the last 150 miles. They already have two-line satellite-based phone service, and they will need a new satellite connection to get online, Bowers said.

Native people in Canada

Total bands (tribes) in Canada: 626 (197 in British Columbia)

Total registered in British Columbia: 105,530 (55,429 on reservations)

Smallest bands:
New Westminster (6)
Popkum (11)
Lake Cowichan (13)

Largest bands:
Cowichan (3,294)
Squamish (2,939)
Lax-Kw'alaams (2,616)

Source: Department of Indian Affairs and Northern Development, British Columbia

"There will be an Internet connection at Takla Lake, but it is very expensive and definitely involves the federal government in a larger way," Bowers said. The band will get the school hooked up through a different government program.

THE RIGHT STUFF

Gitksan is outsourcing its Internet setup to two Canadian business partners — HLVD Interactive Systems Ltd. in Regina, Saskatchewan, and Clan Raven Systems in Kamloops, British Columbia. Clan Raven is run by Gerald Couldwell, a First Nation's businessman who knows the region well, having grown up in Kitimat (which translates roughly to "valley of the snows"), where some winters meant 30 feet of snow.

The partners have contracts to help nine bands go online, and another 10 are waiting for government approval, according to HLVD Interactive Systems President Alfred Strauch. His company provides a Java-based data management service that uses technology from SilverStream Software, Inc. in Burlington, Mass.

The bands will send information on electronic forms to a database located in Vancouver and a mirrored site in Regina. Clan Raven and HLVD Interactive Systems are working out a database interface to deliver information to the government.

Gitksan officials, in particular, like the idea of a backup system because a fire destroyed one of the band's offices and all of its paper-based records last year. □

Web eases investor service

CONTINUED FROM PAGE 37

of the Fortune 1,000.

Companies use those sites to post information about quarterly earnings, financial filings and stock prices.

Boeing prominently posts its stock price not only on its Web site, but also on several key intranets. That reminds employees that they all affect the firm's performance, Lorenz said.

IT'S ALL ABOUT ACCESS

Boeing also posts up-to-date information on airplane orders and deliveries, for example, which investment houses and analysts track closely. To print and mail a report could take weeks; to post that information on the Web can take just hours, she said.

Companies such as Corporate Communications Broadcast Network (CCBN) in Boston and StockMaster, a division of Marketplace.net, Inc. in San Jose, Calif., have sprung up to create Web-based investor relations pages for companies that don't want to sap their in-house IT resources. Boeing, for example, uses StockMaster for its stock data.

Eastern Enterprises in Weston, Mass., a billion-dollar corporation with divisions such as Boston Gas, is a CCBN customer. "We are a holding company. We don't have a lot of resources here to do Web site development," said Jane McCahon, vice president of corporate relations at the firm.

Many investor relations specialists say the benefit of the Web is that it gets information out to everyone at the same time. Companies typically fax financial news to top analysts and institutional investors right after it hits the news wires.

But it is impossible to "blast-fax" everyone.

LOOKING FOR INFORMATION

Companies with investor relations Web sites	86%
Companies planning such sites by year's end	10%
Percentage of corporate investor relations Web sites that have:	
Press releases (besides corporate earnings)	93%
Earnings announcements	90%
Product and service information	82%
SEC filings	76%
Corporate profile	74%
Annual reports	71%
Information on contacting stock agents	68%
Quarterly reports	63%

Source/Base: Survey of 202 corporate members of the National Investor Relations Institute, Vienna, Va., which had about 2,100 corporate members when the survey was conducted in the first half of 1998, including a majority of the Fortune 1,000

"It levels the playing field between institutional investors and individual investors," Levenson said.

"It's a way to get information to people in a hurry," added Ted Meyer, a spokesman for General Electric Co. in Fairfield, Conn., which has about 2 million investors and gets an average of 7,000 visitors per day on its investor relations site. On volatile market days that can soar to 15,000.

GE redesigned its site this spring, adding financial reports from the Reuters news service. In June, the company posted information about its GE Stock Direct program, which allows people to purchase shares directly from the company without using a broker.

Potential investors can view a prospectus online and apply by E-mail, instead of requesting information by phone that would take days to arrive.

"It's having quite a significant impact," said Louis M. Thompson, president and CEO of the National Investor Relations Institute. "People have said the Web sites are saving a lot of time." □

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NEW PRODUCTS

VIDEOSOFT has announced VSForum, software to incorporate discussion forums into World Wide Web sites and intranets.

According to the Emeryville, Calif., company, the software lets users add browser-independent, open-threaded discussion forums to Web sites with one line of code.

When users post or reply, the message text is compiled, saved to a server-based database and published as Hypertext Markup Language.

Administrators control creation and deletion of topics and messages. Microsoft Corp.'s Internet Information Server 3.0 and NT Server 4.0 are required.

The software costs $499.

VideoSoft
(510) 595-2400
www.videosoft.com

TRILOGY DEVELOPMENT GROUP, INC. has announced Buying Chain, electronic-commerce software that controls what employees can buy over the Internet.

According to the Austin, Texas, company, the server application imposes company approval policies and other business rules on World Wide Web-based purchase orders sent to outside vendor sites, such as office supply retailer sites.

The software costs $995 for 100 users, $4,995 for 500 users and $9,995 for an unlimited license.

Trilogy Development Group
(512) 794-5900
www.trilogy.com

FLICKS SOFTWARE has announced AuthentiX Version 4, software that manages membership areas for Microsoft Corp.'s Internet Information Server.

According to the Santa Monica, Calif., company, the software lets users create form-based or cookie-free private membership World Wide Web site areas that keep NT user names and passwords private.

It validates membership against its own internal database or any external Open Database Connectivity source. Scripts for connecting with online credit-card clearers help enable electronic commerce.

The software costs $299.

Flicks Software
(310) 396-5568
www.flicks.com

HEMERA TECHNOLOGIES, INC. has announced NetGraphics Studio2, World Wide Web illustration and optimization software.

According to the Hull, Quebec, company, the software includes a collection of more than 2,000 royalty-free photo objects and the ability to create photographic-quality textured fonts.

It also enables designers to convert any existing graphical image into a format compatible with and optimized for the Web. Images in Studio2 can be dragged and dropped directly into popular Hypertext Markup Language editors.

The software costs $99.

Hemera Technologies
(819) 772-8200
www.hemera.com

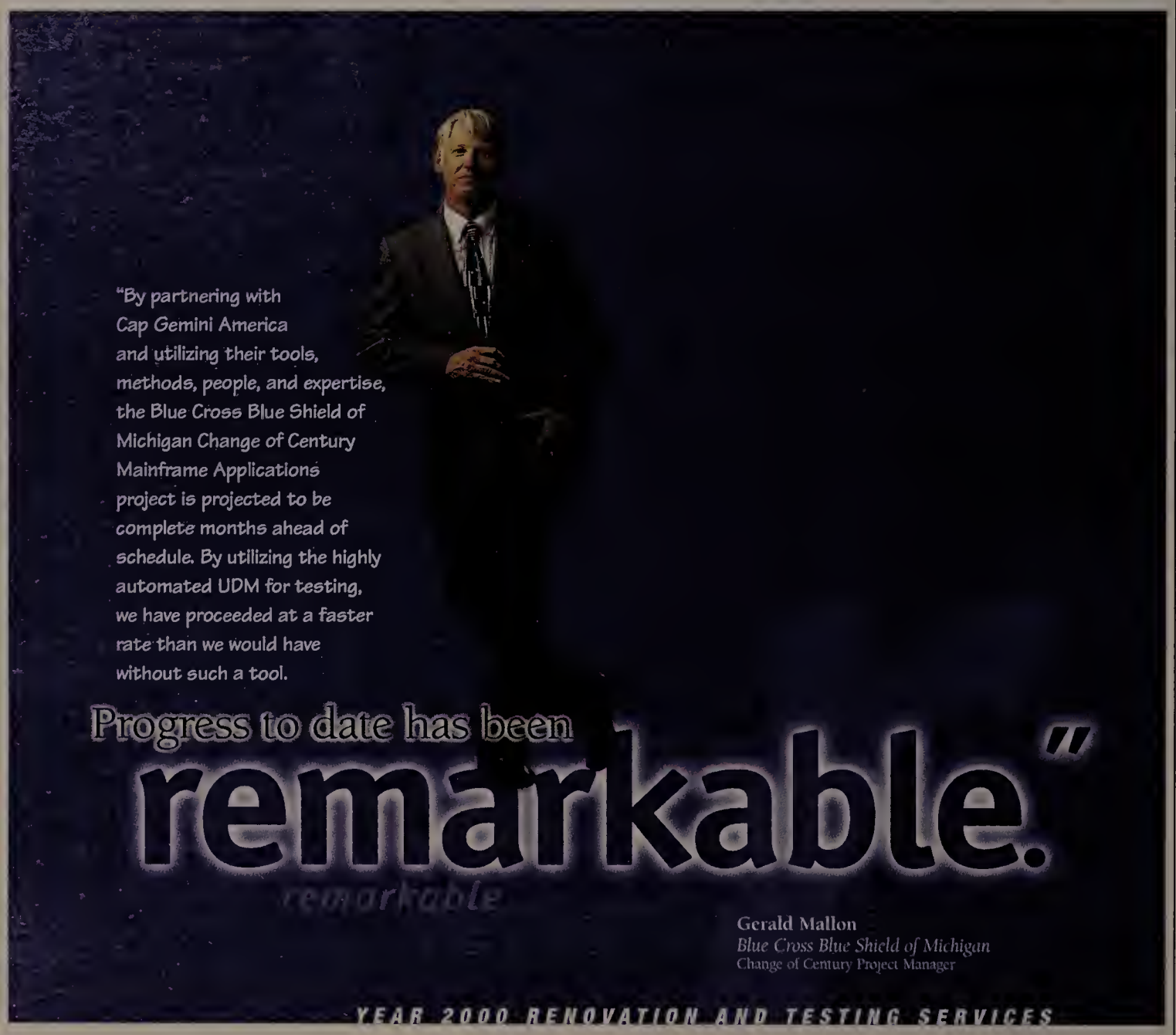
SUNSET DIRECT, INC. has announced Zap-IT and Zap-IT Call Center, Internet push software designed to assist with inbound sales/support calls.

According to the Austin, Texas, company, Zap-IT lets a user remotely control a client's browser in order to push Hypertext Markup Language content directly to the desktop.

It also can remotely control a client CD-ROM drive so that multimedia presentations can be directed over the Internet. Zap-IT Call Center can multicast to 1,500 concurrent users and includes reporting and demographics collection features.

Pricing for Zap-IT starts at $199 per seat; Zap-IT Call Center starts at $5,000.

Sunset Direct
(512) 464-8500
www.sunsetdirect.com



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Submit a request for quote for your Y2K renovation or testing project and we'll respond within 48 hours (two business days). And if you initiate it before October 30, you'll receive a $100,000 credit on your first engagement.*

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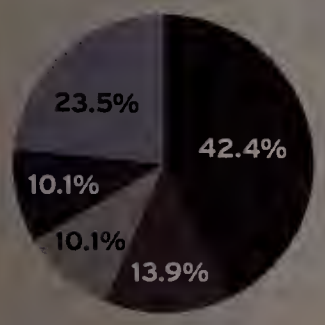
The Enterprise Network

LANs • WANs • Network Management

Briefs

Worldwide revenue breakdown from LAN switch sales, Q1 1998



Total market: $1.92B

Base: Vendor sales data
Source: Dataquest, San Jose, Calif.

Bug avoids Exchange

Microsoft Corp. officials said the bug that reportedly affects the company's Access database and Jet, the default database engine used with the company's Visual Basic development tool, doesn't affect the database engine that underlies the Microsoft Exchange server. The two database engines are very different, officials said.

Sales bundle offered

Houston-based Interliant, Inc. and Synergistics, Inc. in Cincinnati last week said they will bundle Synergistics' Prevail Professional sales force automation software with Interliant's hosting service to offer a technology bundle that sales organizations can lease or purchase outright. The product is geared at small to midsize businesses that may not have the skilled personnel and money to get a sales force automation system up and running quickly, officials said. With the Interliant/Synergistics bundle, those companies can save money by renting the system instead of paying capital costs up front, they said. Customer contracts and service will be available from a single party to be determined.

Cabletron a one-stop shop

By Bob Wallace

AT FACE VALUE, Cabletron Systems, Inc.'s announcement last week of two switches with router functions meant it had completed a product line. But users said the technology is taking a backseat to the benefits of single-vendor networking: volume discounts, no finger-pointing and a lower training requirement.

ROUTING SWITCHES

Routing switches — also called Layer 3 switches — combine the speed of a switch with the efficiency of a router, eliminating the need for slower, more expensive backbone routers. Routing switches, which perform the same tasks as routers, but more quickly, will eventually force backbone routers into the role of gateways between networks, analysts say.

Before routing switches emerged, Cabletron built a large base of switch customers. Afterward, users' choice was to rip out the Cabletron switches and go with another vendor for both switches and routers or add routers from another vendor. Cabletron now offers a one-stop option.

"The benefit here would be being able to deal with one vendor because it would let us negotiate the best price. [It] means one contact for service and our staff wouldn't have to worry about knowing and supporting two vendors' products," said Bob Begun, director of networks and systems at Nathan-Lewis Securities, Inc., an independent brokerage in New York.

The company already uses one of Cabletron's routing switches, the SmartSwitch Router. It replaced a Cisco router that has been reassigned to duty on the firm's wide-area network, Begun said.

James Wiedel sees pros and a potential con to putting all your eggs in one basket.

"Eliminating vendor finger-pointing would be a giant plus," said Wiedel, network manager at the University of Southern California, which uses Cabletron switches and Cisco routers. "You could also reap the benefits of volume discounts. And when you have one vendor, you can upgrade your network in one fell swoop instead of piece by piece."

But there could be a big downside, Wiedel warned.

Cabletron, page 42

SETH AFFOUMADO

USC's James Wiedel: "You could also reap the benefits of volume discounts"

Tools help keep R/3 transactions in line

▸ *Small-vendor offerings target user needs*

By Craig Stedman

A BIG PART of Doug Agnew's job at Charlotte Pipe and Foundry Co. is making sure business transactions flow smoothly through the company's SAP R/3 software.

But until recently, Agnew had to sit down and manually run reports to identify transactions that were running slowly, bogging down response times for customer service workers and other R/3 users. And R/3's built-in system management tools let him look at only up to 40 problem transactions at one time, when he might want to examine hundreds.

Trying to get a better grip on things, Charlotte Pipe recently installed R/3 application management software developed by Envive Corp. Agnew said he now can set response-time thresholds and get alerts when R/3 transactions exceed his predefined limits.

That should help Agnew, a database administrator and R/3

R/3 tools, page 42

THREE ON A MATCH

Details on new R/3 application management tools

Vendor	Supported functions	Starting price
Envive	Service-level reporting, response-time monitoring and problem detection	$57,000 for full suite
Luminate	Analysis of service levels, workloads and stress tests	$15,000 to $50,000 per tool
OptiSystems	Problem detection, service-level reporting, configuration and performance management	$57,500 for problem detection tool, with 100 users

EDWARD SANTALONE

•Workflow information

Notes system aids sales

By Roberta Fusaro

ONE OF THE world's largest suppliers of office products is weaning its sales force from paper reports to feed them customer information straight from the database.

The once-per-month activity reports Esselte Office Products salespeople relied on during calls on customers lacked key information such as current order status, customer satisfaction reports, buying patterns and market trends that could have helped make or break a sale.

The company wanted to gain an edge over larger competitors by putting better information in the hands of salespeople as they dealt with customers, said Blanche LeCausi, manager of information systems and integration at Esselte in Garden City, N.Y.

So Esselte, a division of the

Notes system, page 42

Notes system aids sales

CONTINUED FROM PAGE 41

$1.9 billion, Stockholm-based Esselte Group, automated the sales force using laptops and Lotus Notes.

The company had used a mix of CC:Mail and Notes Mail clients for messaging.

The new system includes a customer history manager, price manager, inventory manager and call/contact report manager — databases that can be replicated to a salesperson's laptop so the information is available in the field. It is called the Esselte Sales Information System (ESIS) and was developed for Esselte by Corporate Software & Technology, Inc. (CS&T) in Norwood, Mass.

"They can see everything they need to know — including buying patterns [and] sales comparisons for the past few years and up to that day," LeCausi said. Salespeople download current data each day; previously, that information was weeks behind them on a mainframe miles away.

The system is scalable enough to handle transactions all across the U.S. and in Mexico and Canada, she said.

The sales information system replicates about 100,000 files each night — a huge amount of data for a Notes application to handle, LeCausi said.

Training was minimal, she said, security hasn't been an issue and salespeople are reaping the benefits of having information instantly accessible during calls — which Esselte hopes will boost sales over time.

Esselte tacked ESIS onto its mainframe via IBM's MQSeries middleware and through a scripting program CS&T developed to translate files to Notes. ESIS was up and running for beta testing last November, and everyone switched to the system in January. In the second phase of the project, the system will feature customizable views of the information.

Amy Gately, an analyst at Dataquest in Boston, said it is more likely that Esselte will see savings primarily of time, rather than cost savings. "Their main strategy is to decrease calls for customer service and maintain better relationships between sales reps and clients," she said.

Indeed, the company has improved customer service at the call-center level. Because sales questions are being answered by sales representatives on-site, there has been a significant decrease in calls, LeCausi said.

David Marshak, a senior analyst at Patricia Seybold Group in Boston, said there are lots of other examples of Notes being used in customer service and sales force automation applications, both commercial and homegrown.

They play on Notes' strength: By using different views, everyone can get the information they need — customer history, product information and sales information — all in one database, he said. □

On-demand training

Lotus Development Corp. last week said it will create a portfolio of on-demand training products for Notes users, and it announced the first application in that portfolio, QuickCards for Notes 4.6.

QuickCards will let users click on an icon to call up a set of instructions for handling Notes tasks such as calendaring and scheduling. The QuickCards instructions — which can take the form of text, images or Lotus ScreenCam movies — appear alongside the application and give the user step-by-step instructions, company officials said.

The QuickCards technology was developed by Usability Sciences Corp. in Dallas to help trim the time and expense of training users on complex applications such as those made by SAP AG, PeopleSoft, Inc. and The Baan Co. It was designed especially for companies or departments that experience high turnover, such as call centers, because training can be deployed right at the desktop as needed.

QuickCards work with Notes 4.5 and 4.6 on Windows 3.1, Windows NT 4.0 and Windows 95 platforms. The QuickCards software is available now and costs $17 for single user, $148 for a 10-user license and $730 for a 50-user license.

The Notes client already features an online help system, said Diane Riemer, a product manager for ScreenCam. But topics are indexed by Notes function in QuickCards, which can be more helpful for users, she said.

— Roberta Fusaro

R/3 tool suites target user needs

CONTINUED FROM PAGE 41

support team member, move faster to clear throughput snags in the software. Agnew said he can even warn the Charlotte, N.C., pipe maker's help desk to get ready for a surge of calls from R/3 users when performance problems crop up.

The performance monitor Charlotte Pipe uses is part of a group of R/3-specific management tools that have emerged from Envive and other small vendors. And more products are on the way.

For example, Opti-Systems, Inc. in Naples, Fla., this week plans to announce a four-product suite of performance management software for SAP AG's market-leading business applications. An initial R/3 performance monitoring tool is due this month.

That follows last week's introduction of R/3 workload and stress test analysis tools by Redwood City, Calif.-based Luminate Software Corp., which already sells an SAP service-level analyzer. And Envive, in Mountain View, Calif., last week upgraded its three R/3 management tools and bundled them as a single package.

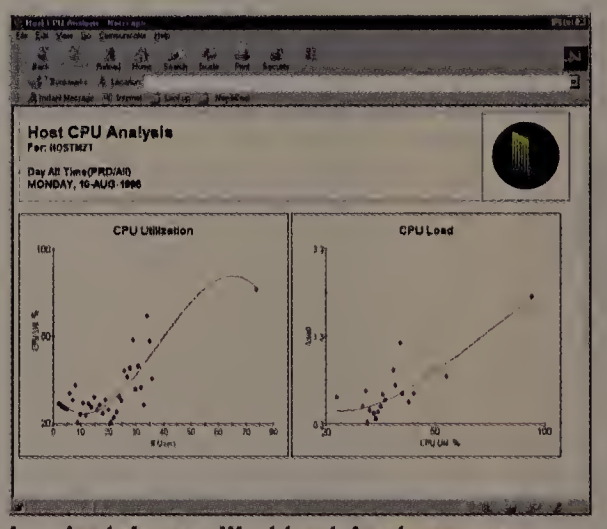
Paul Mason, an analyst at International Data Corp. (IDC) in Framingham, Mass., said the new tools focus more tightly on managing R/3 from the user perspective than general-purpose systems management products do. And they are more sophisticated than the "very basic" administration capabilities SAP builds into R/3, he said. IDC is a sister company to *Computerworld*.

But the new software is still maturing and could benefit from improvements in areas such as reporting and ease of use, Mason said. And usage is still limited: Envive and Luminate said they have about 75 customers between them.

Hylsamex, a steelmaker in Monterrey, Mexico, uses Luminate's service-level anaysis software to track R/3 performance problems and write reports for technology and business managers.

Response times slowed down as R/3 usage grew to 1,500 users, said Hector Armendaiz, an SAP technology manager at Hylsamex. Armendaiz tried to analyze the problems with R/3's own management module, but he said the reports it produced focused on internal systems issues and were "more for technical guys than for upper management."

With the Luminate software, Armendaiz added, response-time data can be collected and organized so business executives "can understand what is happening with their systems" from the standpoint of how users are affected. □



Luminate's new Workload Analyzer can track how the number of R/3 users impacts system resources and performance

Cabletron

CONTINUED FROM PAGE 41

"There is the potential that the vendor can screw something up, and you could be dead," Wiedel said. "If there's a bug in their code, for example, you're going to get it."

Nonetheless, networking vendors have been striving to fill out product lines so they can pitch complete packages. Cabletron is the last of the big four networking firms to offer a full line of routing switches, analysts said. Cabletron users now have the one-stop shopping option, but don't expect an exodus from backbone routers to the new switches, one analyst said.

"It'll likely take at least two to three years for their entire user base to migrate," said John Morency, vice president at Renaissance Worldwide, Inc., a Newton, Mass., consulting and research firm. "The move has already begun because the routing switches offer users much better performance and functionality." □

SHORTS

Mail service support

Critical Path, Inc. in San Francisco, a provider of outsourced E-mail services for Internet service providers, World Wide Web-hosting companies and businesses, last week said it will provide back-office support for Network Solutions, Inc.'s Dot Com Mail service. Network Solutions, in Herndon, Va., is the global registrar of Internet addresses ending in .com, .net, .org and .edu. Dot Com Mail will feature Internet address reservation for future Web use and two electronic mailboxes. The enhanced service will be offered to existing Network Solutions registrants for free for a limited time. After that, it will cost $4.95 per mailbox per month.

1-2-3 . . . download!

Cambridge, Mass.-based Lotus Development Corp. has announced that voice templates for its Lotus 1-2-3 spreadsheet can be downloaded from the company's Web site (*www.lotus.com/smartsuiteupdates*). The 1-2-3 spreadsheet application, which is part of Lotus' SmartSuite Millennium Edition, includes a custom version of IBM's ViaVoice software. The SmartMaster templates will let users dictate their expense reports, calculate their loan payments or build their own custom voice-activated spreadsheets. Lotus will post additional templates at the site as they are developed.

NEW PRODUCTS

OLICOM, INC. has announced RapidFire 3530 and Crossfire 8650, an adapter and a switch uplink that enable a 100M bit/sec. Token Ring.

According to the Richardson, Texas, company, the gear converts 16M bit/sec. ports on an existing Crossfire 8600 Token Ring switch into ports with 100M bit/sec. bandwidth.

The RapidFire 3530 is a Peripheral Component Interconnect file-server adapter, and the CrossFire 8650 is a two-port uplink module for the Crossfire 8600 switch. The RapidFire 3530 adapter costs $350, and the Crossfire 8650 uplink module costs $1,100.

Olicom
(972) 907-4600
www.olicom.com

ONEWORLD SYSTEMS, INC. has announced the OneWorld 5000 Suite Server, a communications server for offices with telecommuting employees.

According to the Sunnyvale, Calif., company, the server combines fax, remote access and Internet routing. It includes server hardware, network connectivity/management software and 56K bit/sec. modem capabilities for both dial-in and dial-out Internet access. Configurations start with four ports and can be upgraded to 34 ports. Users access faxes as they would E-mail, from one central file.

OneWorld 5000 Suite Server costs $4,595.

OneWorld Systems
(877) 697-2677
www.oneworldsystems.com

CITADEL TECHNOLOGY, INC. has announced WinShield for Networks Version 3.0, management and security software for Windows-based desktops.

According to the Dallas-based company, administrators can assign different security levels, called profiles, to individuals and groups.

The software automatically applies the appropriate security to any network computer a "profiled" user logs on to.

It can prevent changes to system settings, restrict application access and prohibit the installation of unauthorized software.

Pricing starts at $259 for a 10-user license.

Citadel Technology
(214) 520-9292
www.citadel.com

INFOVISTA CORP. has announced VistaViews for Networks, an application suite for network performance management and service-level agreement reporting.

According to the Redwood City, Calif., company, the suite includes four VistaViews applications: Network Service Levels, WAN Circuits, Routers and LAN Segments.

All four provide real-time and historical reporting and analysis. WAN Circuits reports on frame-relay, Asynchronous Transfer Mode and lease-line serial link WANs. LAN Segments offers remote monitoring Ethernet segment summaries, LAN load and daily group exception reports. The VistaViews for Networks suite, one server engine and support for unlimited clients costs $20,000 for NT and $27,000 for Unix.

InfoVista
(650) 366-1810
www.infovista.com

Coming Next Week in Computerworld

A white paper on Business Quality Messaging, reliable middleware to connect companies and applications.

Sponsored by the BQM Forum and produced by Computerworld Enterprise Publications, the white paper examines the development of a messaging infrastructure using message queuing technology from IBM, Microsoft and others.

The BQM Forum was founded in April 1997 by AT&T, Compaq, IBM, Intel, Microsoft and other companies to quickly develop and promote messaging oriented middleware for volume enterprise applications. Today BQM technology is found in products from IBM, Microsoft and nearly a dozen other vendors. For more information visit the BQM Web site: www.bqm.org.

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Software

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Briefs

ADD IT UP

How many software vendors do you rely on to run your logistics operations?

Base: 50 Fortune 1,000 companies surveyed in July; operations include inbound and outbound shipping, warehouse management and product distribution

Source: Forrester Research, Inc., Cambridge, Mass.

Messaging link

Constellar Corp. in Redwood Shores, Calif., last week announced plans for a link between its applications integration engine and IBM's MQSeries message queuing software. The connection, due by year's end, will let the batch-oriented Constellar Hub software pass real-time messages among different applications, the company said. Constellar also released a version of its companion data warehouse loading software for Oracle Corp.'s Express multidimensional database.

Constellar Hub pricing wasn't available.

Faster response

Optum, Inc., a maker of supply-chain management software in White Plains, N.Y., this month plans to announce two packages that link its warehouse and transportation management products to back-office applications and advanced business planning systems. The ResponseNet and Response Center software were designed to help users change product distribution plans on the fly in response to last-minute orders and other unexpected events, Optum said.

Pricing for the software hasn't been finalized.

CORBA adoption grows, but slowly

▸ *Its usage is deepest in telecom industry*

By David Orenstein

IN MANY industries, the Common Object Request Broker Architecture (CORBA) has earned the "common" part of its name, but the 7-year-old technology still isn't viewed as a ubiquitous standard, users said.

CORBA use in many sectors is wide but not necessarily deep, observers said. For example, many Wall Street firms use the technology — which promises users the ability to make remote, otherwise incompatible programs interoperate — to run data queries, but transactions have only started to become a serious use, said Steven Wolfe, director of technology strategy and planning at Merrill Lynch & Co.

OBJECT-ORIENTED MIDDLEWARE

Wolfe is the former chairman of the financial domain task force at the Object Management Group (OMG), which administers the CORBA specification. He said the adoption of CORBA in his industry, though not widespread, is growing. Still, "it's slower than I anticipated," Wolfe said.

The recent emergence of transactional capabilities as well as security features and features that preserve the semantic context of data (needed when data is shared among programs) have been necessary developments for CORBA to be more useful for applications beyond querying, Wolfe said.

Overall, "the acceptance is pretty good for CORBA, considering that it is a new technology and considering that there are relatively few people who know how to take advantage of it," said analyst Karen Boucher at The Standish Group International, Inc. in Dennis, Mass.

CORBA, page 46

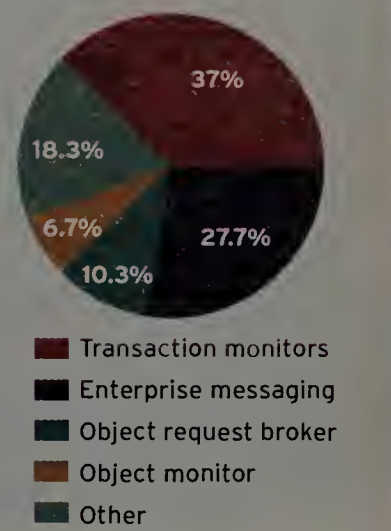
USING CORBA

Total open middleware spending by industry

Telecommunications	17.1%
Banking	16.5%
Manufacturing	15.6%
Securities	9.4%
Services	7.8%
Health care/research	5.4%
Retail	5.3%
Travel	4.5%
Wholesale	4.1%
Other	14.3%
Total spending	**$690M**

Source: The Standish Group International, Inc., Dennis, Mass.

What type of middleware do you use?



Base: 1997 survey of 705 companies

Inprise Delphi 4 suited for more scalable apps

By Howard Millman

WITH DELPHI 4, Inprise Corp. helps corporate and independent developers build distributed applications faster. For shops that develop object-oriented applications that must communicate across multiple platforms, including Windows, Unix and legacy systems, Delphi's component reuse and inclusion of CORBA, Component Object Model (COM) and Distributed Component Object Model (DCOM) make it the sensible choice.

In Delphi 4, Inprise continues the transformation begun with Version 3 [CW, July 21, 1997], moving away from building primarily nondistributed, workgroup-level client/server applications to multitier applications that can support thousands of users.

I tested the client/server version and liked what I saw. For example, Delphi 4 offers a Microsoft Visual Basic-like Inte-

Review, page 49

PRODUCT REVIEW

▸ *Delphi 4*

INPRISE CORP.
Scotts Valley, Calif.
www.inprise.com/delphi

Price: $99.95 Standard; $799 Professional; $2,499 Client/Server Suite.

Pros: Having CORBA, COM and DCOM plus middleware for partitioning makes it hardware- and language-independent.

Cons: Has some problems converting/recompiling applications built under Delphi 3, especially those that lack the original source code.

OVERALL A- GRADE

TCL freeware goes corporate

By David Orenstein

TCL, a freeware scripting language that has become a sleeper hit in many companies because of its ability to integrate applications, objects and even devices, is selling out somewhat to go mainstream. Corporate users said they are tickled pink.

The core of TCL, or the Tool Command Language, will remain freely distributed, said John Ousterhout, who created TCL at the University of California at Berkeley in 1988. But last winter, after four years of enhancing TCL at Sun Microsystems, Inc., he founded Scriptics Corp. in Palo Alto, Calif., to give TCL

Freeware, page 46

Microsoft to spend $100M on support

By Sharon Gaudin

MICROSOFT CORP. has already added 30% more support personnel for the upcoming release of SQL 7.0. Now it is in the process of doing the same for Windows NT 5.0.

The Redmond, Wash., company recently revealed that its investments in support personnel and training will total about $100 million before its upcoming releases of SQL, NT and Office 2000, according to Mark Perry, general manager of product support services at Microsoft.

That's half of the $200 million additional funding that Microsoft President Steve Ballmer promised in July to boost service and support.

Two weeks ago, Microsoft announced how it is spending another $40 million of the total: on a new program called

Microsoft, page 46

Y2K causes nuclear concerns

Finland checks into plants across border

By Ismo Savolainen, Timo Tolsa and Jeanette Borzo
PARIS

AS IT EXECUTIVES and government officials worldwide rush to prepare their nations' systems for the year 2000, some are working double duty by examining the year 2000 readiness at organizations outside their national borders. Finland, for example, is trying to confirm that two Russian nuclear power plants near its border will pass the year 2000 test.

Finland's Sateilyturvakeskus — an organization that reports to a government ministry and cooperates with the Ministry of Trade and Industry on nuclear issues — has asked Russian authorities for safety information concerning nuclear plants on the Peninsula of Kola and in Sosnovyi Bor.

Sateilyturvakeskus isn't terribly worried, because Russia built the plants when the country had no access to Western automation or computer technology and therefore relied heavily on analog technology. The plants' analog devices won't cause any year 2000 failures, but whatever computers the Russians do use might recognize the year 2000 as the year 1900.

A Russian nuclear disaster could quickly become a problem for other countries. A nuclear disaster in Sosnovyi Bor could bring nuclear fallout to southeastern Finland and the city of Helsinki in just a few hours, given proper wind conditions. A disaster at the four-reactor plant on Russia's Kola Peninsula could (again with suitable winds) bring a nuclear danger to Lapland, northern Sweden and Norway, sources said.

Heikki Reponen, a Sateilyturvakeskus official, has received some information about the plants from Russia but found the material lacking details. He said he is still waiting for further information about plant safety. The Russian authorities, for their part, have said the plants will have no year 2000 problems, Reponen said.

The two-reactor Loviisa plant, built in the early 1970s, was based on Russian technology topped off with Western expertise. The Olkiluoto plant, built during the same decade, also has two reactors but is based on Swedish technology.

The companies running the plants said they expect no trouble but are still checking and testing systems thoroughly. They said they expect the plants won't need to shut down because of year 2000 problems.

Russia and Finland aren't the only countries considering the impact of 2000 on their nuclear plants. Already in the U.S., federal officials this year said electric utilities probably won't be entirely ready to supply power to the nation's businesses and homes on Jan. 1, 2000. Some U.S. nuclear plants could be forced to shut down before Jan. 1, 2000, officials said in May.

According to Richard Cowles, year 2000 analyst at TAVA/R.W. Beck LLC, an electric-utility industry consulting firm in Penns Grove, N.J., the Nuclear Regulatory Commission will have to shut down more than 10% of U.S. nuclear plants after July 1999 because their systems won't be ready to handle the date rollover to 2000. □

Savolainen, Tolsa and Borzo are journalists affiliated with sister companies to Computerworld *in Paris and Finland.*

Freeware goes corporate

CONTINUED FROM PAGE 45

dedicated commercial support. Scriptics this week will roll out a suite of tools called TCLPro 1.0. It includes a compiler, debugger and other utilities for $1,000 per user.

The start-up company will also sell training, consulting and technical support.

A lack of corporate support has given many businesses doubts about freeware, said Philip Sutherland, an analyst at Aberdeen Group, Inc. in Boston [CW, Aug. 31]. Support from Scriptics could build the already burgeoning base of 500,000 users, he said.

"TCL is a hidden story [about] how much it is used in corporations," Sutherland said. "I think of it as the ultimate glue. This is a very good option."

Marc Rossi, a vice president at NationsBank Corp.'s Chicago-based global administration services team, said he sees great value in TCL.

"I don't think there's any limit to what TCL can do for us," he said.

Rossi's team writes TCL scripts to monitor and manage networks and devices distributed throughout the company. The bank has begun to use TCL for many new scripts instead of C and C++, which it had used until TCL began to support Windows NT in the mid-1990s. Because TCL is substantially easier to use than C or C++, it lets the team provide support to users in a fraction of the time, Rossi said.

TCL is an integral part of StoryServer, World Wide Web server software from Vignette Corp., a developer in Austin, Texas. StoryServer lets sites track and adapt to individual customer preferences. TCL scripts integrate the data objects and other services that make complex Web sites possible, said Neil Weber, Vignette's chief technical officer. TCL's extensibility also makes it easy for StoryServer users to create their own scripts to integrate custom or legacy services into StoryServer, Weber said.

Rossi and Weber said they are encouraged by the formation of Scriptics. Rossi said the creation of a fully-featured development environment and tool set for TCL will make the language easier for local network managers at NationsBank to use to quickly solve some of their own problems.

Weber said Vignette might not buy the tools but expects to benefit from a commercial company's driving the language's development. "Now there is a place that we can go to," he said. □

Microsoft

CONTINUED FROM PAGE 45

TechNet. TechNet comprises an enhanced CD-ROM, a 140-city tour of full-day corporate training seminars and a new World Wide Web site focused on service and support.

"This is absolutely good news," said Isaac Applbaum, president of Concorde Solutions, Inc., the information technology arm of Bank of America. "With NT 5.0 coming out, they need to have more knowledgeable people in the call centers and ready to help. It just makes it worse when you wait on the line, and then they know less than you do."

ALMOST THERE

Perry said Microsoft is two-thirds of the way through a three-phase training process for the added support personnel for SQL. SQL 7.0 is expected to ship this year.

Perry also said Microsoft has increased NT support personnel by 25% and probably will increase that number further depending on the type and extent of users' needs surrounding beta 2, which was released two weeks ago. He added that those personnel are in the first phase of their training.

Microsoft is also enhancing its online support, Perry said, adding more information and case studies to its Web site at *www.microsoft.com/supportonline*.

"I think they're taking to heart being more proactive," said Randall Kennedy, an analyst at Competitive Systems Analysis in Danville, Calif. "It couldn't hurt. It's definitely a start in the right direction." □

Microsoft is preparing for the upcoming releases of NT 5.0 and SQL 7.0. Here's what it has already done:

- Boosted support personnel for SQL 7.0 by 30%
- SQL support personnel are two-thirds through a three-phase training program
- Boosted support personnel for NT 5.0 by 25%, with an additional increase expected
- NT 5.0 support personnel are in the first phase of their training

CORBA

CONTINUED FROM PAGE 45

The telecommunications industry, which often adopts technologies quickly and is characterized by highly distributed networks with many objects, has made the most use of CORBA, Boucher said. The three applications most likely to use object request brokers — universal personal services, call location and number portability — are all unique to telecommunications.

Several major pharmaceutical and biotechnology companies are working with or considering CORBA as a way to enable the heavy exchange of information in fields such as bioinformatics and cheminformatics and in clinical trials.

WE'LL SEE

"The use of CORBA within the pharmaceuticals industry is increasing, but many companies continue to take a wait-and-see attitude with regard to their own software development," said W. David Benton, co-chairman of the OMG Life Sciences Research Domain Task Force and a director in the advanced information technology department of the research and development unit at SmithKline Beecham Corp. in King of Prussia, Pa.

CORBA use is stronger among newer, genetic research-oriented biotechnology companies that do more of their own software development, Benton said. CORBA use will take off at larger pharmaceutical companies when vendors produce more industry-standard components for the industry, he said.

Though OMG has marketed CORBA successfully to many industries, some large users have remained unconvinced that the technology is really the best one for the job.

"I'm a strong nonbeliever in CORBA," said Jeffrey Borror, IT director at Daiwa Securities Company Limited America in New York. Borror prefers to use an event-based messaging system from Active Software, Inc. Whereas CORBA forces users to wrap up services that aren't objects to conform to an object environment, a publish-subscribe messaging model such as that used at Daiwa shuttles information without "putting fur on the dinosaur and calling it a mammal." Also, under CORBA's approach, if one object changes, others linked to it often also must be changed. □

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Review: Inprise Delphi 4

CONTINUED FROM PAGE 45

grated Development Environment (IDE). But unlike Visual Basic, Delphi also supports Common Object Request Broker Architecture (CORBA), which can help you build scalable, thin-client, low-maintenance applications.

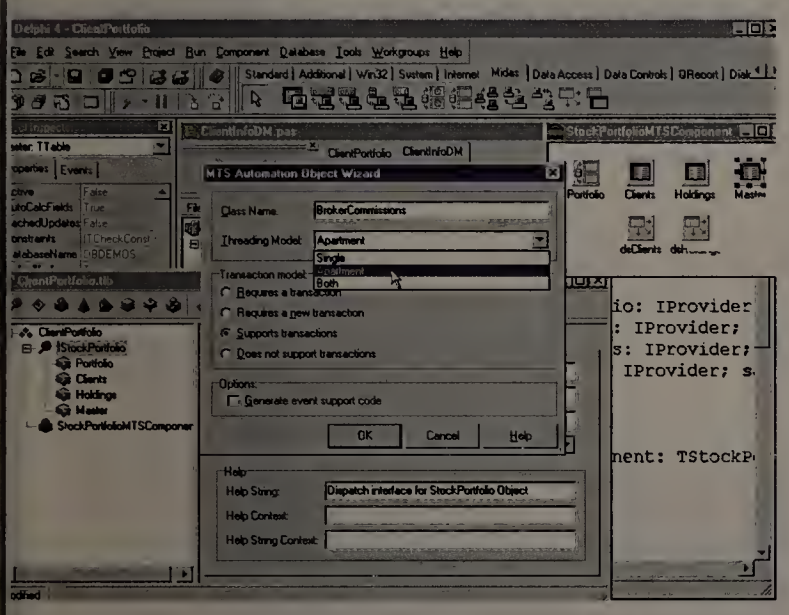
Delphi 4 also moves from a two-tier architecture to a three-tier one. That seems to have gone smoothly, although some Delphi 3 applications may need recompiling. Inprise enhanced its Multi-Tier Distributed Application Services architecture, a technology that manages load balancing, remote management and interobject communication. Inprise also added support for Microsoft's Transaction Server technologies and CORBA. By packaging a single binary as both a native CORBA and COM/DCOM component, Delphi 4 improves developer productivity on cross-platform applications.

That connectivity and reusability enables applications built with Delphi 4 to natively communicate with a wide variety of operating systems and hardware platforms, including most flavors of Unix and legacy systems.

Surprisingly, despite the added middleware, Delphi 4 showed little or no latency, or performance lag. Latency is a traditional weakness of distributed applications caused by the loss of persistent connections to back end data sources.

New or enhanced tools in the client/server suite include high-performance native database drivers, which I used with little effort to link to an Oracle Corp. database; CORBA-based object reuse; Microsoft BackOffice support; multitier development; and Intersolv PVCS source code management.

I experimented with time-savers as I built pilot applications. Good ones include AppBrowser IDE, a browser-like viewer that simplifies finding and writing code plus embedding hyperlinks for faster navigation; a project manager that will let developers compile projects to multiple targets; and debugging tools that include event logs and debug applications running on remote servers or workstations. A new Class Completion Wizard writes more of the code for you, making building class libraries easier for both novices and experienced developers.



Delphi 4 simplifies developing distributed applications that follow COM/DCOM or CORBA standards

If you build cross-platform applications, investigate Delphi's open application programming interface (API) and its support of multiple database engines. The API can help you better manage database services such as cached updates. Caching and the nested tables can reduce data access conflicts on remote database servers by minimizing transaction times and network traffic.

Enhancements specific to the Windows environment include new Windows 98 common controls that help the end user, such as a page scroller, choose-a-date calendar and multiple monitor support.

Overall, Inprise added or improved features that make Delphi 4 better suited for building large-scale, stable and scalable applications while retaining the tool's competent look and feel. □

Millman operates Data Systems Services Group in Croton, N.Y. He can be reached at hmillman@ibm.net.

NEW PRODUCT

W. QUINN ASSOCIATES, INC. has announced StorageCentral, a suite of three Windows NT storage management utilities: QuotaAdvisor, DiskAdvisor and DiskWatcher.

The Reston, Va., company said QuotaAdvisor lets systems managers assign storage-usage limits to any user, group, directory or file. When limits are reached, it prohibits further access to storage resources and sends out an alert. DiskAdvisor has 18 canned storage management reports. DiskWatcher is a pared-down version of QuotaAdvisor that sits on less-critical servers. It can monitor space usage but can't enforce quotas.

QuotaAdvisor and DiskAdvisor together cost $995 per NT server.

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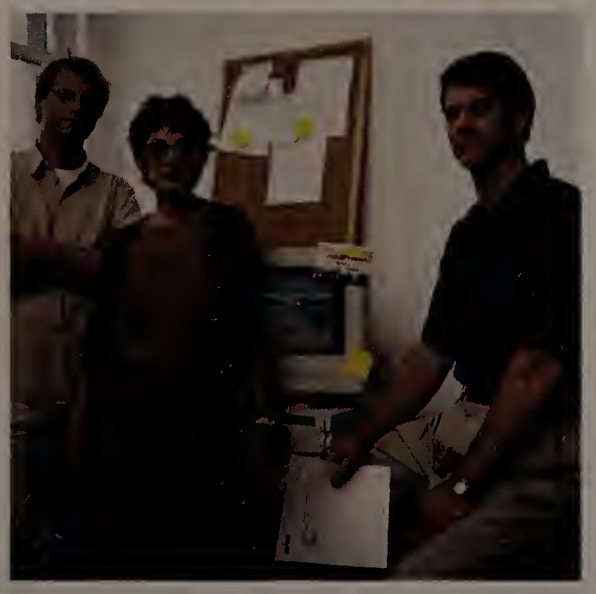

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Briefs

PowerBook price cut

Apple Computer, Inc. last week announced lower prices for its PowerBook notebook computers with 14-in. screen displays. The $2,799 PowerBook features a 233-MHz PowerPC G3 processor with a 512K-byte backside Level 2 cache, 32M bytes of synchronous dynamic RAM expandable up to 192M bytes, a 2G-byte hard drive, 20-speed CD-ROM, ATI Rage LT Pro video controller and two hot-swappable expansion bays.

Copper chips ship

IBM announced last week which lines will feature its copper-based chips. IBM's PowerPC 750 copper microprocessor operating at 400 MHz is available now for $605 per chip in quantities of 1,000, an IBM spokesman said. The chips will also be used in its S/390, RS/6000 and AS/400 server lines next year. Using copper in chips enhances microprocessor performance, decreasing die size and power consumption.

Excalibur signs pact

Excalibur Technologies in Vienna, Va., has announced that it has signed a multiyear, multimillion-dollar licensing, development and distribution pact with network storage provider Storage Technology Corp. in Louisville, Colo. StorageTek will bundle Excalibur's search-and-retrieval products with its storage products and will sell the packages as enhanced solutions for knowledge management and digital content management.

Second-quarter 1998 PC factory shipments to Europe, Africa and the Middle East

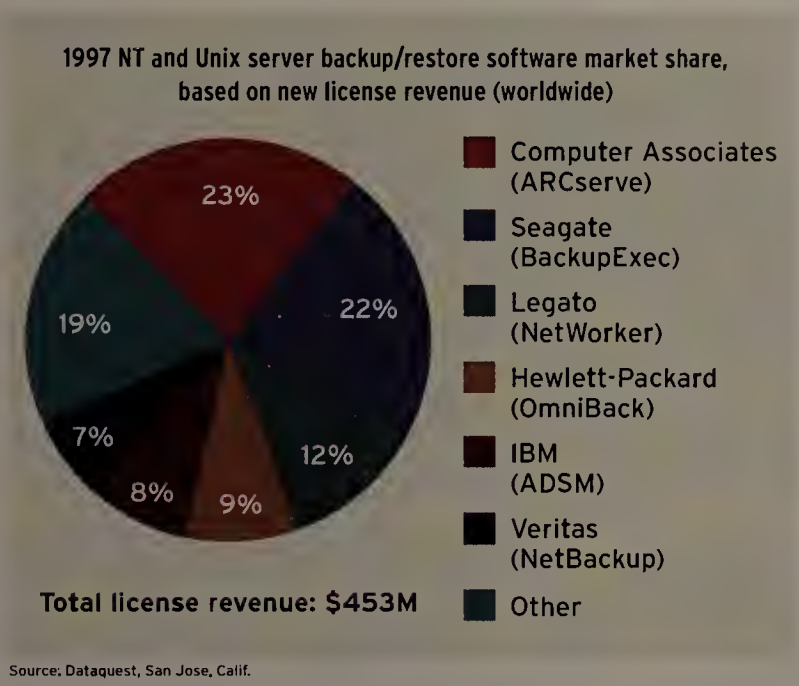
Compaq	1,055,314
Dell	479,924
IBM	452,743
Hewlett-Packard	370,168
SNI	338,565
Other	3,458,162

Source: International Data Corp., Framingham, Mass.

BP tries packaged backup

▸ *Are shrink-wrapped apps ready for global backup responsibility?*

By Nancy Dillon



Source: Dataquest, San Jose, Calif.

ALTHOUGH SOME analysts remain skeptical about packaged applications' ability to handle companywide distributed backup, a technology manager at BP Oil is forging ahead with just such a program.

Ian Julien, central technology manager at BP Oil International, the refining and marketing arm of The British Petroleum Co. in London, is testing NetWorker backup software from Legato Systems, Inc. The plan is to move 250 Unix servers in 21 countries from backup software developed in-house to NetWorker by year's end.

Julien said he had been shopping for a package to handle the worldwide job for years, but only recently have vendors started to address his needs: the ability to back up and restore 350 Oracle databases and to have 13 internationally dispersed Unix staffers respond to problems across borders.

He said Legato's architecture is proving itself capable of meeting those requirements.

"Maybe NetWorker doesn't support every platform out there yet, but if you worry about only going with applications that are perfect, you'll never go with anything," Julien said.

"And you have to weigh the drawbacks of a packaged application against those of custom software," he added. "With our own application, we had to worry about fixing problems, recompiling [updated versions], and security was also a big consideration. A third-party application cuts down on risk because it's harder to tamper with."

Julien said it is difficult to quantify how the switch from custom to packaged software will affect his bottom line, but he said minimizing the threat of security infractions more than justified NetWorker's implementation expense.

"These servers transact billions of dollars per year in customer orders and billing," Julien said. "If we're down for a day, we're just losing bank interest. But if we're down for a few days or weeks — well, you can do the math."

Sean Derrington, an analyst at Meta Group, Inc. in Stam-

Packaged backup, page 54

Mobile devices to gain ERP capability

▸ *Software combo will aid remote workers*

By Clare Haney
HONG KONG

SYBASE, INC. and Abaco International Group are working on a software combination that will let high-end R/3 enterprise resource planning (ERP) applications from SAP AG run on mobile and embedded devices, the two companies announced last week.

For corporate users of ERP applications, the software combination will make it possible to gather ERP data from remote-location staff members using low-cost mobile or embedded devices, Sybase said. To that end, Sybase and Abaco — a systems integrator and software developer — are integrating Sybase's yet-to-be-released UltraLite database with Abaco's The Bridge for R/3 platform-integration technology.

The UltraLite database requires as little as 50K bytes of memory to run. It was designed for use in embedded devices that run Microsoft Corp.'s Windows CE and 3Com Corp.'s Palm OS operating systems, a Sybase statement said. UltraLite, a subset of Sybase's Adaptive Server Anywhere low-end relational database, is due to start beta testing in the third quarter. It will become publicly available the following quarter.

The UltraLite database requires as little as 50K bytes of memory to run.

The companies said two-way data synchronization can take place from a remote location to SAP's full-blown R/3 system by using the two products — UltraLite and The Bridge for R/3 — together.

"The integration of our UltraLite database with R/3 provides low-cost remote access to SAP's

Mobile devices, page 54

Notebook bargains find home on Internet

By Matt Hamblen

FUJITSU PC CORP. last week launched an Internet store to sell low-cost, refurbished LifeBook notebook computers to cost-conscious buyers.

Analysts said corporate laptop managers are unlikely to buy machines in quantity from the site but will nonetheless benefit from it.

That's because laptop vendors will have another outlet to sell used corporate machines, as companies seek new ones every 18 to 24 months under their leasing programs, said analysts Mike McGuire at Dataquest in San Jose, Calif., and Gerry Purdy at Mobile Insights, Inc. in Mountain View, Calif.

Theoretically, that could keep lease prices lower, the analysts said.

The site (*http://onlineoutlet.fujitsu-pc.com*) last week offered only two models, including a refurbished 765DX with a 166-MHz MMX processor, a 2G-byte hard drive and an internal 56K bit/sec. modem for $999.

But officials at the Milpitas, Calif.-based Fujitsu said the site will soon include models with Pentium II processors and accessories.

The refurbished models will mostly be sold to education groups, foreign buyers and consumers, Purdy predicted.

McGuire warned users to carefully examine terms of the warranties provided for refurbished systems. □

BP tries packaged backup

CONTINUED FROM PAGE 53

ford, Conn., said that though companies providing open systems enterprise backup are still at least a year away from providing enterprise-class management, Legato is in the top tier. So are IBM and Veritas Software Corp., he said.

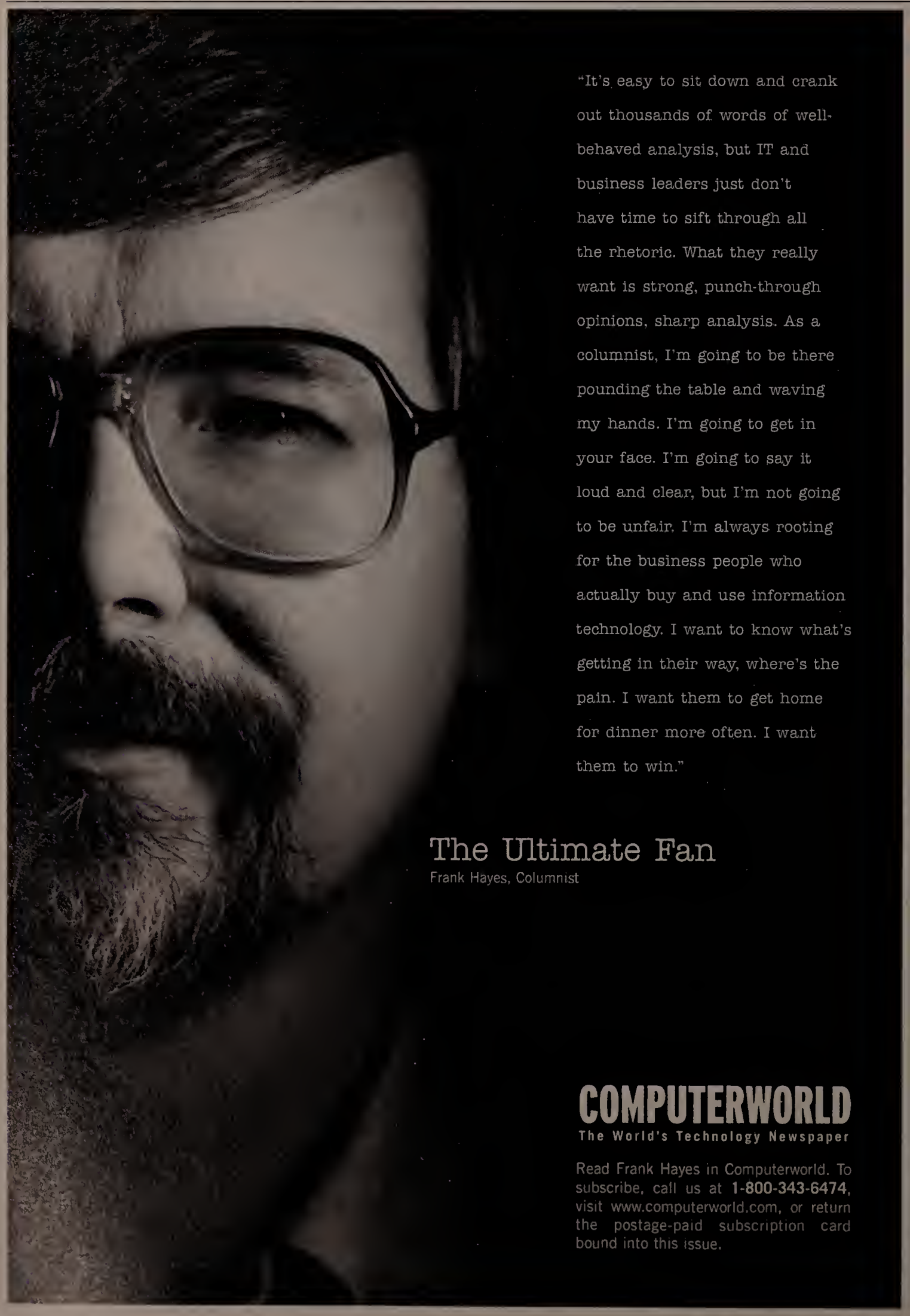
"They're all top contenders. But we still haven't seen a user site with a system of global management in production," Derrington said "This is something that will mature over the next year."

Legato announced global policy-making software last September. Another application, called Storage Reporter, is due by November. The Java-based module offers a single enterprise view of backup success logs and reports exceptions.

Both products appeal to Julien, he said. "We already have a global paging system in place. And we like to operate under the assumption that everything is working unless told otherwise," he said.

For lower-end LANs and workgroups, Seagate Technology, Inc. has announced enhancements to BackupExec for NT. For $695 per server, users will now get the basic backup package along with virus removal software and a tool that can restore the most recently used files first. Seagate also announced agents for Exchange and SQL databases from Microsoft Corp. The Exchange agent now supports individual mailbox backups and can restore embedded documents, OLE objects and attributes such as whether a message has been read.

"Since we moved to Exchange this year, E-mail is becoming more important," said Jim Morgan, a vice president at Spearman Cattle Feeders, Inc. in Graysville, Ala. "My users would get irate if [an Exchange restore] didn't put everything back." □



Mobile devices to gain ERP capability

CONTINUED FROM PAGE 53

ERP business processes, enabling two-way communication at a lower cost of ownership," said Terry Stepien, vice president and general manager of product marketing at Sybase.

The two companies demonstrated the technology at SAP's TechEd '98 in Los Angeles last week. The TechEd demonstration centers around a soft-drink vending machine running the UltraLite database. Using Abaco's The Bridge for R/3 software in conjunction with technology from EmWare, 3Com and Micron, the application tracks inventory and customer-buying patterns from the vending machine and then can relay and synchronize that information with an SAP R/3 system.

In June, Abaco, 3Com and Symbol Technologies, Inc. announced a tie-up aimed at making R/3 data available to mobile users. Symbol contributed its handheld devices based on 3Com's Palm OS operating system.

Sybase itself has had something of a checkered past with SAP. The German vendor's ERP applications have yet to run natively on Sybase's relational database Adaptive Server (formerly SQL Server) because Sybase's database lacks a technology called row-level locking.

Row-level locking lets applications such as SAP's R/3 hook on to a specific row in a database rather than just a page, resulting in fewer upsets when several people are making changes to the database. The missing feature is slated to appear in Sybase's Adaptive Server Enterprise database Version 11.9.2, due by year's end [CW, June 16]. □

Haney writes for the IDG News Service in Hong Kong.

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Managing

Computerworld's 12th ANNUAL SALARY SURVEY

By Leslie Goff

ENOUGH is ENOUGH

- Managers are putting the brakes to out-of-control IT salaries
- Last year's average 11% raises have dropped to 4%
- And although bonuses are still going up for key rank-and-file employees, those at the top are often earning less

On the Eastern Shore of the Chesapeake Bay, in easygoing Cambridge, Md., business casual is the rule rather than the exception at electronics maker Philips Technologies.

Come summertime, the living is easy. The company shuts down at 2:30 p.m. on Fridays so employees can beat the rush to the beach. Salaries aren't especially high, but the quality of life is.

Still, just across the Bay Bridge lies the region's triple crown of riches: Annapolis, Baltimore and the Beltway. And for Steve Hammond, Philips' information technology director, that presents a threat to the stability of his IT staff.

"Cambridge is definitely a lifestyle choice," Hammond says. "There's no doubt that any of my people could take another job within an hour or two from here and get $10,000 to $15,000 more per year."

Hammond's counterparts in and around major metropolitan areas across the country are facing the same challenge: hanging on to indispensable IT staff members when other companies seem willing to up the ante for their skills.

Several information systems organizations continue to bloat salaries as a means of retaining and recruiting employees. But after years of raising wages to market rates and beyond, many managers are cutting back on base pay increases and looking for salvation in innovative bonus programs and noncash incentives.

In fact, the typical increase in IS salaries from 1997 to 1998 was between 3% and 5%, according to *Computerworld*'s 12th Annual Salary Survey, conducted in June. That increase is in line with most occupations and considerably lower than the previous year's 11% average.

Although 12.6% of the 807 IS managers who responded said they doled out more than 10% extra per employee this year, most (52.1%) tried to hold the line: 20.8% said their staff averaged a 4% increase, 17.5% said 3%, and 13.8% said 5%.

"Two years ago, we were offering people lucrative salaries and above-average raises. This year, the average was 4%," says Frank Santariga, MIS manager at Chrysler Capital Corp. in Stamford, Conn., which is in the New York metropolitan area. "We haven't had people leave for higher salaries because ours have typically been above the job market. But we need to keep people here, and I knew that if I didn't provide some increase, we'd start losing people."

Indeed, nearly one-third (32.4%) of respondents reported double-digit turnover percentages. Hoping to stem the tide, even companies that are reluctant, or unable, to fatten regular paychecks are paying year-end performance and loyalty bonuses, as well as project incentives, referral fees and nonmonetary performance awards, at all levels of the IS organization.

Average additional compensation ranged from $16,960 for chief information officers to $4,803 for voice and data communications managers, $3,552 for database analysts, $3,338 for project leaders, $2,687 for senior systems analysts and $1,682 for webmasters.

An IS executive at one East Coast manufacturer, who asked not to be identified, is considering a millennium bonus: If IS employees are still there on Jan. 1, 2001, they could be eligible for a payout of 10% to 15% of their annual salary. "The challenge of replacing people when they leave has been absolutely unbelievable," the executive says. "It's not uncommon to have positions open for as long as four months."

Even when turnover isn't a big

WHAT'S LEVELING THIS PLAYING FIELD?

A major factor in the leveling off of salaries, and the decline of annual performance bonuses, may be the high budget toll of signing bonuses paid to hire new IT talent. Here are some high-range sign-on bonuses paid to bring key IT job titles on board, often not reflected in traditional performance bonus amounts:

JOB TITLE	MANUFACTURING COMPANIES	NONMANUFACTURING COMPANIES
Database analyst	$15,000	$9,900
Webmaster	$12,800	$11,100
Network analyst	$12,300	$9,700
Systems analyst	$9,200	$8,800

Note: All salaries have been rounded off to the nearest hundred

problem, forward-thinking managers are rewarding employees to make sure it doesn't become an issue. At systems integrator The Green Pages in Kittery, Maine, 15% of each IS staff member's salary is tied to financial results, and 5% is based on individual performance. Last year, IS salaries grew 30%.

In addition, the company has created a President's Club that offers the highest performers annual, all-expenses-paid long weekends in places such as the Bahamas, says Peter Matthewson, an IT specialist. Only two people have left IS in the past two and a half years.

"We want people to build relationships with our external and internal customers," Matthewson says, explaining the company's generosity. "We have a grill outside, and we have barbecues and parties. We have on-site day care. We have an in-house trainer on-site leading aerobics and yoga classes. People want to come to work every day."

The salary survey reflects the axiom that every action has an equal and opposite reaction, however. For every company like The Green Pages is one like Sherwood Foods, a Detroit-based wholesale grocery distributor where the average IS salary increase for this year was only 2%.

It would be futile to ask for larger increases because "management is miserly," says Paul Dholakia, Sherwood's data processing manager. "Management doesn't see IT as critical until something breaks down."

But Dholakia doesn't have a turnover problem. His IT environment still consists of dumb terminals hanging off a midrange server connected by modems and multiplexers and in-house software that has been in place for years.

"We aren't dealing with client/server or a cutting-edge system," Dholakia says. "That has a lot to do with retention because there are not a lot of companies competing for these skills. If we suddenly became a PC-based environment, things would turn 180 degrees."

Salary increases also were lower in more remote areas such as Sioux Falls, S.D., and Conway, Ark., where quality-of-life issues keep employees from moving on.

First National Bank in Sioux Falls gave network manager Ken Birnstiehl a 7% raise after he implied he would leave, but only after he reluctantly agreed to take on three direct reports. The rest of the bank's IS staff earned an extra 4%.

At Conway Regional Medical Center, located about 30 minutes from Little Rock, Ark., MIS director D. K. Martin accepted a 2% pay increase so he could give his staff 4% extra in their paychecks.

"I only have one trained person taking care of all of our networking, and his skills are certainly in high demand," Martin says. "But he wants to stay in this area, and we are taking advantage of that. He's probably making at least 20% below market value for his skills."

Bob Sachs, assistant director of corporate MIS at steel tube maker John Maneely Co. in Collingswood, N.J., a suburb of Philadelphia, says his department nearly doubled IS salaries this year because of 50% turnover last year. The company also offered new recruits project incentives and longevity incentives. At the end of each of their first three years, new hires will get a bonus payout that will increase each year.

"I have the feeling that base salaries are close to standard for the Northeast, but we are studying our structure because we're not sure we're in line with the market," Sachs says. "But with the current demand, it's hard to know from week to week what is current."

ILLUSTRATIONS BY VON R. GLITSCHKA

Recognizing the lure of the cities across the bay, Philips' Hammond used national IT salary data and an analysis of the local market to convince his executive management that without substantial salary increases, the company was at risk. With a lean staff and mission-critical applications running on an AS/400 platform, Philips couldn't afford defections.

Hammond won his people two consecutive annual increases of between 8% and 20% each. Nonetheless, his most valued employee — a senior programming manager who received the biggest raise — handed him two weeks' notice this summer.

"He was offered a sign-on bonus, a higher salary, a big year-end bonus and stock in the company for a job across the bridge," Hammond explains. He says he worries that Philips' executive management will tire of his efforts to satisfy salary demands. "They know we have done a lot for this guy, and yet he still got all these other perks. So they fear that it's like a roller coaster on its way down — it is hard to stop." □

Goff is a freelance writer in New York.

"HOW GREEN IS MY VALLEY?"

How do you stack up in the geographical salary war? Here are the typical total IT compensation figures (base salary plus bonuses) for select IT job titles, by region:

JOB TITLE	NATIONAL AVERAGE	NEW ENGLAND*	MIDDLE ATLANTIC*	EAST-NORTH CENTRAL*	WEST-NORTH CENTRAL*	SOUTH ATLANTIC*	EAST-SOUTH CENTRAL*	WEST-SOUTH CENTRAL*	MOUNTAIN*	PACIFIC*
CIO/VP of IS	$116,100	$149,200	$125,700	$118,600	$105,400	$106,000	$111,900	$100,200	$89,800	$117,900
Director of networks	$72,400	$84,900	$75,300	$67,900	$72,400	$71,000	$64,400	$62,600	$63,900	$78,100
Network administrator	$48,700	$62,800	$53,100	$49,100	$45,700	$46,200	$46,000	$48,000	$42,800	$49,700
LAN manager	$53,600	$66,000	$55,900	$55,000	$49,500	$49,900	$56,800	$55,000	$51,000	$58,800
Sr. programmer/analyst	$54,500	$66,100	$53,500	$54,300	$53,700	$49,200	$53,600	$57,400	$52,500	$61,100
Programmer/analyst	$45,300	$53,400	$45,200	$43,800	$43,300	$45,500	$41,100	$46,100	$43,300	$47,500
Webmaster/Web designer	$49,600	$60,000	$41,200	$45,800	$45,900	$47,600	$47,200	$48,200	$43,100	$49,600
Lead computer operator	$35,100	$39,700	$39,800	$34,600	$32,900	$33,900	$30,900	$31,000	$35,200	$39,900

Note: All salaries have been rounded off to the nearest hundred

* Regions are as follows: New England = Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island; Middle Atlantic = New York, New Jersey, Pennsylvania; South Atlantic = Delaware, District of Columbia, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Puerto Rico, U.S. Virgin Islands; East-North Central = Wisconsin, Michigan, Illinois, Indiana, Ohio; East-South Central = Kentucky, Tennessee, Mississippi, Alabama; West-North Central = North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri; West-South Central = Oklahoma, Arkansas, Louisiana, Texas; Mountain = Idaho, Montana, Wyoming, Nevada, Utah, Colorado, Arizona, New Mexico; Pacific = Alaska, Washington, Oregon, California, Hawaii, Guam

MANAGING

Computerworld's 12th ANNUAL SALARY SURVEY

"PLEASE, SIR, I WANT MORE"

While IT base salaries have risen 3% to 4% for most rank-and-file IT positions, they have mostly leveled off or dropped at the top levels of the IT organization. Bonuses have also dropped substantially for many IT job titles — again, more so at the top.

JOB TITLE	1997 SALARY	1997 BONUS	1998 SALARY	1998 BONUS
CIO/VP of IS	$100,300	$23,800	$99,100	$17,000
Director of IS/MIS	$72,300	$8,100	$73,000	$8,700
Director of networks	$66,900	$7,400	$66,800	$5,600
Network administrator	$44,700	$2,700	$46,300	$2,400
Senior systems analyst	$53,200	$3,200	$56,700	$2,700
Systems programmer	$46,400	$2,900	$48,100	$2,400
Database analyst	$50,500	$3,500	$54,300	$3,600

Note: All salaries have been rounded off to the nearest hundred

TOP IS MANAGEMENT

CIO/VP of IS	Director of systems development	Director IS/MIS	Director IS operations	Director of networks
Average: $99,105 Bonus: $16,960 Total: $116,065	Average: $76,142 Bonus: $7,014 Total: $83,156	Average: $73,016 Bonus: $8,685 Total: $81,701	Average: $64,644 Bonus: $7,495 Total: $73,139	Average: $66,798 Bonus: $5,559 Total: $72,357

INDUSTRY, NONMANUFACTURING

Retail	$175,818	Retail	$109,333	Trans.	$99,313	Bus. Svc. Non-IT	$98,000	Telecom	$92,833
Telecom	$121,667	Banking	$98,188	Bus. Svc. Non-IT	$91,423	Retail	$94,833	Trans.	$91,500
Insurance	$109,708	Insurance	$91,750	Telecom	$91,167	Trans.	$84,850	Retail	$89,000
Banking	$106,707	Telecom	$83,167	Retail	$91,116	Banking	$79,382	Insurance	$84,200
Bus. Svc. Non-IT	$105,500	Bus. Svc. Non-IT	$82,300	Bus. Svc. Cons./Integ.	$88,750	Insurance	$77,750	Banking	$81,071
Health	$104,441	Distrib.	$81,750	Banking	$82,810	Bus. Svc. Cons./Integ.	$74,440	Health	$75,727
Bus. Svc. Cons./Integ.	$98,654	Bus. Svc. Cons./Integ.	$79,438	Insurance	$82,045	Telecom	$66,000	Bus. Svc. Non-IT	$74,214
Nonprofit	$97,500	Health	$72,000	Distrib.	$76,875	Health	$64,375	Bus. Svc. Cons./Integ.	$66,700
Distrib.	$95,727	Gov't.	$71,217	Health	$74,448	Gov't.	$62,817	Educ.	$63,138
Educ.	$94,028	Educ.	$68,367	Educ.	$69,113	Educ.	$61,403	Gov't.	$60,180
Gov't.	$81,905	Nonprofit	$68,000	Gov't.	$67,745	Nonprofit	$60,000	Distrib.	$57,833
Bus. Svc. IT	$74,083	Bus. Svc. IT	$53,500	Nonprofit	$63,867	Distrib.	$47,800	Nonprofit	$55,800
Trans.	NA	Trans.	NA	Bus. Svc. IT	$47,667	Bus. Svc. IT	NA	Bus. Svc. IT	$47,500

INDUSTRY, MANUFACTURING

Chemical	$179,750	Petrol/ Refining	$97,333	Petrol/ Refining	$100,000	Food/Bev.	$93,500	Petrol/ Refining	$111,000
Forest Prod.	$158,000	Forest Prod.	$92,833	Forest Prod.	$97,000	Forest Prod.	$93,500	Forest Prod.	$97,000
Petrol/ Refining	$150,500	Chemical	$89,667	Electric/ Elec. Equip.	$96,265	Petrol/ Refining	$79,333	Food/Bev.	$87,000
Food/Bev.	$144,250	Met./Plas./ Rubber	$88,750	Computers	$94,600	Electric/ Elec. Equip.	$79,125	Computers	$86,333
Computers	$142,500	Computers	$87,500	Food/Bev.	$93,167	Computers	$72,900	Electric/ Elec. Equip.	$72,000
Consumer Prod.	$117,800	Consumer Prod.	$82,667	Consumer Prod.	$88,643	Met./Plas./ Rubber	$69,667	Met./Plas./ Rubber	$62,400
Electric/ Elec. Equip.	$116,700	Food/Bev.	$81,600	Met./Plas./ Rubber	$82,840	Chemical	$57,000	Consumer Prod.	NA
Met./Plas./ Rubber	$110,050	Electric/ Elec. Equip.	$69,750	Chemical	$77,250	Consumer Prod.	NA	Chemical	NA

COMPANY SIZE (BY REVENUE)

Less than $100M: $89,004 $100M to $499.9M: $122,828 $500M or more: $156,243	Less than $100M: $68,568 $100M to $499.9M: $90,787 $500M or more: $96,264	Less than $100M: $68,295 $100M to $499.9M: $90,787 $500M or more: $104,078	Less than $100M: $58,812 $100M to $499.9M: $76,628 $500M or more: $90,426	Less than $100M: $53,924 $100M to $499.9M: $77,592 $500M or more: $86,974

NETWORKS

Manager of voice/data communications	LAN manager	Network administrator
Average: $60,093 Bonus: $4,803 Total: $64,896	Average: $50,528 Bonus: $3,086 Total: $53,614	Average: $46,253 Bonus: $2,451 Total: $48,703

INDUSTRY, NONMANUFACTURING

Telecom	$92,375	Trans.	$65,944	Telecom	$61,917	Trans.	$76,500	Banking	$58,952
Retail	$78,845	Telecom	$61,375	Trans.	$59,100	Insurance	$75,571	Health	$55,940
Trans.	$76,500	Banking	$58,952	Retail	$54,300	Banking	$71,727	Insurance	$53,850
Insurance	$75,571	Health	$55,940	Banking	$50,088	Health	$67,500	Bus. Svc. Non-IT	$53,000
Banking	$71,727	Insurance	$53,850	Health	$49,521	Bus. Svc. Cons./Integ.	$61,600	Bus. Svc. Cons./Integ.	$51,542
Health	$67,500	Bus. Svc. Non-IT	$53,000	Insurance	$48,500	Bus. Svc. IT	$61,000	Nonprofit	$49,625
Bus. Svc. Cons./Integ.	$61,600	Bus. Svc. Cons./Integ.	$51,542	Bus. Svc. Non-IT	$47,250	Bus. Svc. Non-IT	$59,188	Gov't.	$48,106
Bus. Svc. IT	$61,000	Nonprofit	$49,625	Distrib.	$47,107	Gov't.	$58,885	Educ.	$47,305
Nonprofit	$50,400	Bus. Svc. IT	$42,333	Nonprofit	$42,636	Distrib.	$53,800	Distrib.	$46,667
Distrib.	$48,714	Retail	NA	Bus. Svc. IT	$42,083	Nonprofit	$50,400	Bus. Svc. IT	$42,333

INDUSTRY, MANUFACTURING

Food/Bev.	$84,000	Petrol/ Refining	$64,250	Food/Bev.	$59,667	Chemical	$76,500	Computers	$63,000
Computers	$76,500	Computers	$63,000	Electric/ Elec. Equip.	$53,278	Forest Prod.	$75,000	Forest Prod.	$57,750
Forest Prod.	$75,000	Forest Prod.	$57,750	Computers	$51,889	Petrol/ Refining	$69,667	Electric/ Elec. Equip.	$54,429
Petrol/ Refining	$69,667	Electric/ Elec. Equip.	$54,429	Petrol/ Refining	$50,333	Electric/ Elec. Equip.	$65,000	Chemical	$53,500
Electric/ Elec. Equip.	$65,000	Chemical	$53,500	Consumer Prod.	$47,750	Met./Plas./ Rubber	$59,100	Food/Bev.	$50,000
Met./Plas./ Rubber	$59,100	Food/Bev.	$50,000	Forest Prod.	$46,750	Consumer Prod.	NA	Met./Plas./ Rubber	$48,000
Chemical	NA	Consumer Prod.	$49,000	Met./Plas./ Rubber	$45,125	Food/Bev.	$84,000	Petrol/ Refining	$64,250
Consumer Prod.	NA	Met./Plas./ Rubber	$48,000	Chemical	$43,000	Food/Bev.	$84,000	Petrol/ Refining	$64,250

COMPANY SIZE (BY REVENUE)

Less than $100M: $52,963 $100M to $499.9M $67,653 $500M or more $75,305	Less than $100M: $47,833 $100M to $499.9M $54,172 $500M or more $60,587	Less than $100M: $43,896 $100M to $499.9M $49,946 $500M or more $55,370	Less than $100M: $58,981 $100M to $499.9M: $66,302 $500M or more: $74,344	Less than $100M: $50,869 $100M to $499.9M: $65,891 $500M or more: $75,851

SYSTEMS DEVELOPMENT AND INTEGRATION

Client/server project manager, systems and programming	Database manager
Average: $62,073 Bonus: $4,739 Total: $66,812	Average: $59,367 Bonus: $3,954 Total: $63,321

INDUSTRY, NONMANUFACTURING

Bus. Svc. Cons./Integ.	$79,350	Trans.	$76,214	Trans.	$74,900	Bus. Svc. Non-IT	$72,643	Insurance	$73,000
Trans.	$74,900	Bus. Svc. Non-IT	$72,643	Insurance	$73,000	Banking	$69,667	Banking	$72,844
Retail	$71,250	Bus. Svc. IT	$66,500	Banking	$72,844	Insurance	$69,167	Distrib.	$68,333
Distrib.	$68,333	Distrib.	$63,750	Telecom	$67,700	Bus. Svc. Cons./Integ.	$63,143	Bus. Svc. IT	$67,000
Telecom	$67,700	Bus. Svc. Cons./Integ.	$63,143	Bus. Svc. IT	$67,000	Telecom	$56,667	Nonprofit	$63,400
Bus. Svc. IT	$67,000	Telecom	$56,667	Nonprofit	$63,400	Gov't.	$55,885	Bus. Svc. Non-IT	$60,400
Nonprofit	$63,400	Gov't.	$55,885	Bus. Svc. Non-IT	$60,400	Health	$53,667	Health	$58,929
Health	$58,929	Educ.	$50,660	Educ.	$56,500	Nonprofit	$46,429	Gov't.	$55,600
Educ.	$56,500	Nonprofit	$46,429	Gov't.	$55,600	Retail	NA	Retail	NA

INDUSTRY, MANUFACTURING

Forest Prod.	$87,250	Computers	$69,200	Food/Bev.	$76,286	Consumer Prod.	$68,000	Consumer Prod.	$68,000
Food/Bev.	$76,286	Consumer Prod.	$68,000	Chemical	$74,000	Food/Bev.	$66,000	Food/Bev.	$66,000
Chemical	$74,000	Food/Bev.	$66,000	Petrol/ Refining	$70,500	Electric/ Elec. Equip.	$64,500	Electric/ Elec. Equip.	$64,500
Petrol/ Refining	$70,500	Electric/ Elec. Equip.	$64,500	Computers	$68,750	Met./Plas./ Rubber	$62,000	Met./Plas./ Rubber	$62,000
Computers	$68,750	Met./Plas./ Rubber	$62,000	Electric/ Elec. Equip.	$65,857	Petrol/ Refining	$60,000	Petrol/ Refining	$60,000
Electric/ Elec. Equip.	$65,857	Petrol/ Refining	$60,000	Met./Plas./ Rubber	$63,313	Forest Prod.	$54,500	Forest Prod.	$54,500
Met./Plas./ Rubber	$63,313	Forest Prod.	$54,500	Consumer Prod.	NA	Chemical	NA	Chemical	NA

COMPANY SIZE (BY REVENUE)

Less than $100M: $58,981 $100M to $499.9M: $66,302 $500M or more: $74,344	Less than $100M: $50,869 $100M to $499.9M: $65,891 $500M or more: $75,851

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Computerworld's 12th ANNUAL SALARY SURVEY

WHO GETS THE BIGGEST INCREASES?

The following industries reported the largest average increase in total IT compensation:

INDUSTRY	% OF TOTAL COMPENSATION INCREASE
Business services-IT	13%
Financial services	10%
Telecommunications	9.9%
Business services-consulting	9.6%
Food/beverage/tobacco	8.7%
Computer hardware/software	8.3%

SYSTEMS DEVELOPMENT AND INTEGRATION

Mainframe project manager, systems and programming	Manager of Internet/ intranet technology	Senior systems analyst	Database analyst	Senior systems programmer	Senior programmer/ analyst	Systems analyst	Systems programmer	Webmaster/ Web designer	Programmer/ analyst
Average: $58,745	Average: $57,369	Average: $56,682	Average: $54,254	Average: $54,618	Average: $52,140	Average: $51,261	Average: $48,133	Average: $45,264	Average: $43,707
Bonus: $3,338	Bonus: $2,581	Bonus: $2,687	Bonus: $3,552	Bonus: $2,566	Bonus: $2,328	Bonus: $2,592	Bonus: $2,356	Bonus: $1,682	Bonus: $1,578
Total: $62,083	Total: $59,950	Total: $59,369	Total: $57,806	Total: $57,184	Total: $54,468	Total: $53,853	Total: $50,489	Total: $46,946	Total: $45,285

INDUSTRY, NONMANUFACTURING

Bus. Svc. Cons./Integ.	$76,500	Insurance	$85,000	Bus. Svc. Cons./Integ.	$73,750	Retail	$73,750	Telecom	$76,167	Telecom	$71,875	Bus. Svc. IT	$68,000	Telecom	$61,167	Trans.	$61,214	Telecom	$58,125
Trans.	$76,000	Trans.	$84,571	Trans.	$68,600	Trans.	$67,000	Retail	$69,375	Bus. Svc. IT	$66,500	Trans.	$63,125	Trans.	$57,571	Telecom	$60,200	Bus. Svc. Cons./Integ.	$49,542
Retail	$73,600	Retail	$79,625	Distrib.	$66,417	Banking	$63,650	Bus. Svc. IT	$63,000	Trans.	$61,200	Bus. Svc. Cons./Integ.	$60,357	Insurance	$54,700	Banking	$56,750	Banking	$48,665
Banking	$64,184	Telecom	$73,000	Banking	$64,944	Insurance	$61,600	Trans.	$62,875	Banking	$59,267	Retail	$58,750	Banking	$52,778	Insurance	$56,125	Trans.	$47,773
Nonprofit	$62,625	Banking	$64,250	Bus. Svc. IT	$58,000	Bus. Svc. Non-IT	$59,714	Bus. Svc. Cons./Integ.	$60,250	Retail	$58,375	Distrib.	$58,500	Bus. Svc. IT	$51,333	Retail	$53,367	Retail	$46,687
Insurance	$61,346	Bus. Svc. Non-IT	$61,250	Nonprofit	$55,500	Nonprofit	$52,000	Banking	$59,538	Bus. Svc. Non-IT	$55,389	Banking	$56,000	Health	$50,714	Bus. Svc. Cons./Integ.	$50,145	Distrib.	$45,813
Bus. Svc. Non-IT	$61,214	Bus. Svc. Cons./Integ.	$61,143	Health	$55,273	Telecom	$51,667	Insurance	$55,313	Distrib.	$55,286	Educ.	$54,548	Bus. Svc. Non-IT	$49,750	Bus. Svc. Non-IT	$46,857	Insurance	$45,105
Health	$56,636	Health	$57,500	Insurance	$54,885	Educ.	$49,950	Health	$54,000	Health	$54,808	Health	$54,188	Bus. Svc. Cons./Integ.	$48,875	Health	$43,375	Nonprofit	$44,357
Educ.	$55,538	Distrib.	$53,167	Telecom	$53,167	Gov't.	$49,279	Distrib.	$54,000	Bus. Svc. Cons./Integ.	$54,714	Insurance	$52,750	Gov't.	$46,174	Bus. Svc. IT	$41,500	Bus. Svc. IT	$44,333
Gov't.	$53,571	Educ.	$52,636	Bus. Svc. Non-IT	$53,000	Bus. Svc. IT	$48,333	Gov't.	$53,611	Insurance	$53,429	Telecom	$52,000	Educ.	$43,167	Gov't.	$40,923	Health	$43,433
Bus. Svc. IT	$53,000	Gov't.	$49,625	Educ.	$52,885	Bus. Svc. Cons./Integ.	$46,700	Bus. Svc. Non-IT	$52,600	Nonprofit	$51,417	Bus. Svc. Non-IT	$50,667	Distrib.	$39,500	Educ.	$40,221	Bus. Svc. Non-IT	$43,400
Distrib.	$53,000	Bus. Svc. IT	$39,000	Gov't.	$51,236	Health	$45,571	Nonprofit	$52,250	Gov't.	$48,344	Nonprofit	$49,863	Nonprofit	$37,250	Distrib.	$33,125	Gov't.	$41,493
Telecom	$47,000	Nonprofit	NA	Retail	NA	Distrib.	$45,250	Educ.	$51,023	Educ.	$47,185	Gov't.	$47,397	Retail	NA	Nonprofit	$30,333	Educ.	$39,957

INDUSTRY, MANUFACTURING

Forest Prod.	$81,250	Met./Plas./ Rubber	$67,250	Food/Bev.	$74,300	Computers	$59,000	Computers	$60,200	Computers	$65,500	Forest Prod.	$69,000	Food/Bev.	$58,000	Petrol/ Refining	$74,000	Consumer Prod.	$57,667
Food/Bev.	$77,333	Computers	$65,750	Consumer Prod.	$67,250	Petrol/ Refining	$57,500	Chemical	$60,100	Chemical	$59,167	Food/Bev.	$58,000	Chemical	$57,000	Computers	$53,667	Forest Prod.	$54,083
Chemical	$73,500	Electric/ Elec. Equip.	$62,500	Forest Prod.	$63,000	Met./Plas./ Rubber	$55,700	Petrol/ Refining	$60,000	Forest Prod.	$58,300	Computers	$57,750	Petrol/ Refining	$56,000	Food/Bev.	$51,500	Food/Bev.	$48,556
Computers	$73,500	Food/Bev.	$59,500	Met./Plas./ Rubber	$61,364	Electric/ Elec. Equip.	$51,125	Met./Plas./ Rubber	$53,833	Food/Bev.	$57,333	Electric/ Elec. Equip.	$55,400	Computers	$54,750	Met./Plas./ Rubber	$42,000	Computers	$46,750
Electric/ Elec. Equip.	$64,900	Petrol/ Refining	$58,000	Computers	$61,100	Forest Prod.	$51,000	Electric/ Elec. Equip.	$53,000	Met./Plas./ Rubber	$54,500	Petrol/ Refining	$51,500	Met./Plas./ Rubber	$51,929	Electric/ Elec. Equip.	$40,167	Met./Plas./ Rubber	$43,125
Consumer Prod.	$62,500	Forest Prod.	$40,000	Electric/ Elec. Equip.	$60,333	Food/Bev.	$45,000	Food/Bev.	$48,500	Consumer Prod.	$53,667	Met./Plas./ Rubber	$48,214	Electric/ Elec. Equip.	$50,667	Chemical	NA	Chemical	$43,100
Petrol/ Refining	$61,333	Chemical	NA	Chemical	$58,000	Chemical	NA	Consumer Prod.	NA	Electric/ Elec. Equip.	$50,273	Chemical	NA	Forest Prod.	$50,500	Consumer Prod.	NA	Electric/ Elec. Equip.	$42,800
Met./Plas./ Rubber	$59,929	Consumer Prod.	NA	Petrol/ Refining	$57,500	Consumer Prod.	NA	Forest Prod.	NA	Petrol/ Refining	$50,000	Consumer Prod.	NA	Consumer Prod.	NA	Forest Prod.	NA	Petrol/ Refining	$40,000

COMPANY SIZE (BY REVENUE)

Less than $100M: $57,909	Less than $100M: $46,774	Less than $100M: $54,928	Less than $100M: $48,288	Less than $100M: $51,102	Less than $100M: $50,510	Less than $100M: $50,453	Less than $100M: $45,375	Less than $100M: $40,164	Less than $100M: $42,601
$100M to $499.9M: $61,345	$100M to $499.9M $64,660	$100M to $499.9M: $62,064	$100M to $499.9M: $60,212	$100M to $499.9M: $59,300	$100M to $499.9M: $55,939	$100M to $499.9M: $58,042	$100M to $499.9M: $55,619	$100M to $499.9M: $50,321	$100M to $499.9M: $46,229
$500M or more: $67,193	$500M or more: $72,028	$500M or more: $63,145	$500M or more: $62,821	$500M or more: $62,459	$500M or more: $58,513	$500M or more: $57,632	$500M or more: $53,110	$500M or more: $56,750	$500M or more: $47,395

Computerworld's 12th ANNUAL SALARY SURVEY

OFF TO A GOOD START

A look at the salaries that entry-level IT professionals can expect to negotiate this year in select industries:

INDUSTRY	COMPUTER PROGRAMMER	PC TECHNICAL SUPPORT SPECIALIST	HELP DESK OPERATOR
Business services & consulting	$31,800	$30,700	$27,400
Computer hardware & software	$38,300	$33,400	$30,200
Construction	$32,500	$31,400	$28,500
Education	$31,300	$30,000	$25,900
Government	$31,100	$30,100	$26,800
Health care	$33,400	$31,800	$27,300
Transportation	$36,300	$34,300	$29,400

Note: All salaries have been rounded off to the nearest hundred

TECHNICAL SERVICES AND OPERATIONS						PC END-USER SUPPORT					
Computer operations manager		Computer operations supervisor		Lead computer operator		Micros manager/ end-user computing manager		Technical support manager/help desk manager		PC technical support specialist		Computer operator	
Average: $52,749		Average: $43,107		Average: $33,877		Average: $52,323		Average: $45,620		Average: $34,316		Average: $27,604	
Bonus: $3,286		Bonus: $1,874		Bonus: $1,206		Bonus: $2,697		Bonus: $2,127		Bonus: $1,388		Bonus: $912	
Total: $56,035		Total: $44,981		Total: $35,083		Total: $55,020		Total: $47,747		Total: $35,704		Total: $28,516	
INDUSTRY, NONMANUFACTURING						**INDUSTRY, NONMANUFACTURING**					
Bus. Svc. Cons./Integ.	$68,167	Retail	$54,000	Bus. Svc. Cons./Integ.	$48,000	Trans.	$73,429	Insurance	$59,400	Retail	$41,343	Telecom	$34,900
Retail	$67,312	Insurance	$49,438	Retail	$37,400	Insurance	$67,667	Trans.	$57,686	Telecom	$37,500	Bus. Svc. Cons./Integ.	$31,800
Banking	$66,179	Banking	$48,036	Banking	$36,947	Retail	$66,250	Telecom	$55,900	Insurance	$37,346	Trans.	$30,556
Telecom	$65,500	Telecom	$46,000	Insurance	$35,636	Banking	$57,250	Banking	$53,533	Banking	$35,886	Gov't.	$28,959
Insurance	$61,929	Trans.	$44,818	Nonprofit	$35,500	Telecom	$53,750	Bus. Svc. Cons./Integ.	$50,667	Gov't.	$34,745	Insurance	$28,400
Trans.	$59,000	Bus. Svc. Cons./Integ.	$44,667	Gov't.	$35,359	Gov't.	$52,208	Retail	$50,277	Distrib.	$34,545	Bus. Svc. Non-IT	$28,313
Bus. Svc. Non-IT	$56,583	Educ.	$43,575	Telecom	$34,500	Bus. Svc. Cons./Integ.	$49,833	Gov't.	$46,500	Bus. Svc. Non-IT	$34,250	Banking	$27,976
Distrib.	$55,429	Gov't.	$43,308	Educ.	$34,310	Bus. Svc. Non-IT	$48,300	Bus. Svc. Non-IT	$46,125	Bus. Svc. Cons./Integ.	$34,227	Nonprofit	$27,333
Health	$52,577	Bus. Svc. Non-IT	$39,600	Bus. Svc. Non-IT	$32,917	Health	$48,188	Health	$43,500	Nonprofit	$33,714	Retail	$27,270
Educ.	$50,768	Nonprofit	$39,000	Health	$31,269	Educ.	$48,125	Educ.	$41,957	Educ.	$33,582	Health	$27,146
Gov't.	$50,077	Health	$38,673	Distrib.	$30,500	Nonprofit	$47,500	Nonprofit	$37,750	Health	$31,800	Distrib.	$27,087
Nonprofit	$45,067	Distrib.	$36,500	Trans.	NA	Bus. Svc. IT	$44,500	Distrib.	$34,500	Bus. Svc. IT	$28,500	Educ.	$26,743
Bus. Svc. IT	NA	Bus. Svc. IT	NA	Bus. Svc. IT	NA	Distrib.	NA	Bus. Svc. IT	$34,000	Trans.	NA	Bus. Svc. IT	NA
INDUSTRY, MANUFACTURING						**INDUSTRY, MANUFACTURING**					
Computers	$73,875	Petrol/ Refining	$47,667	Chemical	$40,250	Computers	$67,000	Electric/ Elec. Equip.	$43,200	Consumer Prod.	$42,500	Petrol/ Refining	$36,333
Petrol/ Refining	$62,000	Food/Bev.	$44,125	Petrol/ Refining	$38,167	Met./Plas./ Rubber	$62,000	Forest Prod.	$44,000	Petrol/ Refining	$41,750	Electric/ Elec. Equip.	$30,833
Met./Plas./ Rubber	$60,625	Chemical	$43,200	Met./Plas./ Rubber	$32,125	Petrol/ Refining	$60,667	Met./Plas./ Rubber	$46,438	Met./Plas./ Rubber	$41,231	Chemical	$29,800
Chemical	$59,000	Met./Plas./ Rubber	$42,917	Electric/ Elec. Equip.	$31,600	Consumer Prod.	$56,500	Food/Bev.	$49,000	Computers	$39,591	Met./Plas./ Rubber	$27,944
Electric/ Elec. Equip.	$57,688	Electric/ Elec. Equip.	$42,000	Food/Bev.	$28,667	Food/Bev.	$56,000	Computers	$56,143	Chemical	$38,400	Consumer Prod.	$24,667
Forest Prod.	$55,500	Computers	NA	Forest Prod.	$22,250	Electric/ Elec. Equip.	$41,500	Petrol/ Refining	$56,333	Electric/ Elec. Equip.	$37,438	Food/Bev.	$23,625
Food/Bev.	$49,500	Consumer Prod.	NA	Consumer Prod.	$21,000	Chemical	$33,000	Chemical	NA	Food/Bev.	$35,778	Computers	NA
Consumer Prod.	$46,500	Forest Prod.	NA	Computers	NA	Forest Prod.	NA	Consumer Prod.	NA	Forest Prod.	$30,000	Forest Prod.	NA
COMPANY SIZE (BY REVENUE)						**COMPANY SIZE (BY REVENUE)**					
Less than $100M: $51,066		Less than $100M: $41,054		Less than $100M: $33,635		Less than $100M: $45,462		Less than $100M: $42,000		Less than $100M: $32,982		Less than $100M: $26,722	
$100M to $499.9M: $56,180		$100M to $499.9M: $41,886		$100M to $499.9M: $32,988		$100M to $499.9M: $58,981		$100M to $499.9M: $45,122		$100M to $499.9M: $36,065		$100M to $499.9M: $28,718	
$500M or more: $63,757		$500M or more: $50,079		$500M or more: $38,336		$500M or more: $63,000		$500M or more: $56,684		$500M or more: $39,885		$500M or more: $31,098	

METHODOLOGY

Computerworld conducted a nationwide survey on information systems managers to determine the annual salaries, salary increases, additional compensations and turnover for IS personnel. The mail survey was conducted in June of 1998. A total of 855 respondents provided data on multiple job titles.

Average number of IS employees	
Manufacturing	294
Nonmanufacturing	305
Average number of employees	
Manufacturing	4,211
Nonmanufacturing	2,971
Estimated average revenue or assets (in millions)	
Manufacturing	$1,085
Nonmanufacturing	$1,025
Base responses by job title	
Top IS Management:	
CIO/VP of IS/IT	285
Director, systems development	212
Director IS/MIS	401
Director IS operations	201
Director, networks	178
Networks:	
Manager of voice/data communications	183
LAN manager	250
Network administrator	378
Systems Development and Integration:	
Client/server manager, systems & programming	226
Database manager	162
Mainframe project manager, systems & programming	194
Manager, Internet/intranet technology	111
Senior systems analyst	222
Database analyst	132
Senior systems programmer	170
Senior programmer/analyst	252
Systems analyst	157
Systems programmer	139
Webmaster/Web designer	152
Programmer/analyst	325
Technical Services & Operations:	
Computer operations manager	234
Computer operations supervisor	164
Lead computer operator	204
PC End-User Support:	
Micros manager/end-user computing manager	147
Technical support manager/help desk manager	200
PC technical support specialist	335
Computer operator	284
TOTAL	5,898

Note: Vertical industry salary figures are not a statistically valid measure of average salaries for those industries but should be used for comparative rankings only. Averages by title and company size are a more reliable measure of typical salaries.

LIKE WHAT YOU SEE?

Whether it's yes or no, we want to know how you feel about your IT salary, bonuses and benefits. Participate in *Computerworld*'s first online Salary Satisfaction Survey, which will go live on our Web site next week.
www.computerworld.com/more

Review Center

Firewall challenge

It's human error that leaves systems vulnerable, a *Computerworld/ Federal Computer Week* test shows

FIREWALLS STAND THE

By Gary H. Anthes

The leading Internet firewalls are a little like today's popular automobiles: Although there are many differences among them, most modern cars can get you from Point A to Point B reliably, safely and efficiently.

Crashes and other failures are most likely due to user error, as they are for firewalls.

Indeed, a particular firewall may be better able than others to meet a given user's unique needs, and experts say it pays to compare features.

But they say it is more important how you set up and maintain a firewall — and how carefully you craft the security policies it's there to enforce -— than which product you choose.

That advice was borne out by a recent exercise conducted by *Computerworld* and *Federal Computer Week* in which computer security experts, armed with sophisticated hacking tools, repeatedly attacked four of the leading network firewalls. Each product performed pretty much as advertised, and all protected internal systems from penetration.

However, the firewalls didn't perform perfectly, either because of inherent flaws in the firewalls, flaws in the underlying operating system or suboptimum configuration by the user. One of the firewalls was knocked out by a denial-of-service attack. And each of the three attack teams gleaned a lot of information about systems behind the firewalls, information better kept hidden.

The denial-of-service attack, launched by Security Design International, Inc. using a freeware attack tool called Targa, brought down one of the firewalls, effectively stifling all incoming and outgoing traffic until the computer was rebooted. Another firewall withstood the Targa attack because it had the very latest NT security patches applied, says Bob Stratton, a vice president at the Falls Church, Va.-based company. Time and logistics prevented the team from launching Targa at the remaining two firewalls.

A network outage brought on by a denial-of-service attack may be more costly to a company than a theft of information, experts say. "If you're going to use technology that forces all network traffic through a choke point — and for good reason — you'd better make sure it stays up in the face of adversity," Stratton says.

The attack teams also were able to learn more about systems behind the firewall than a firewall and its administrator should allow in the interests of security. For example, the Ernst & Young LLP team was able to learn the identities of the LAN server behind the firewall and various services running on it. "Knowing that [Microsoft] Exchange was running there, we had the potential to further exploit the box by knowing certain Exchange vulnerabilities," says Eric Schultze, a senior manager in Ernst & Young's security practice.

Ernst & Young also was able to determine the address of the internal network, the status of various NT ports and other information. The

Firewalls, page 64

FPG INTERNATIONAL

THE FIREWALLS

Axent Technologies, Inc.
Rockville, Md.
Axent Raptor Firewall 5.0
Pricing ranges from $1,875 for 25 users to $11,250 for unlimited users.
www.axent.com

Secure Computing Corp.
San Jose, Calif.
Firewall for NT Version 3.1
Pricing ranges from $995 for 25 users to $8,995 for unlimited users.
www.securecomputing.com

NetGuard, Inc.
Fairfax, Va.
Guardian
Pricing ranges from $2,480 for 25 users to $8,980 for unlimited users.
www.ntguard.com

Compaq Computer Corp.
Houston
AltaVista Firewall '98
Pricing ranges from $2,495 for 25 users to $14,995 for unlimited users.
www.compaq.com

THE ATTACK TEAMS

Deloitte & Touche
New York
Fred Rica, partner
Mike Beekey, manager
www.dttus.com

Ernst & Young LLP
Hackensack, N.J.
George Kurtz, senior manager
Eric Schultze, senior manager
www.ey.com

Security Design International, Inc.
Falls Church, Va.
Don Hewitt, president
Bob Stratton, vice president of technology
Chris Goggans, vice president of operations
www.sdii.com

For more information about firewalls, visit *Computerworld online* at *computerworld.com/more*

FIREWALLS

CONTINUED FROM PAGE 62

ability to get this information is due in part to security weaknesses in NT but could have been blocked by the firewalls, Schultze says.

The Deloitte & Touche team learned the identities of the makers of internal server software, hardware and two of the firewall vendors. That information should have been hidden, says Fred Rica, a partner and attack team member. "You gather bits and pieces of information that by themselves seem innocuous, and all of a sudden you can build a picture of what this thing looks like," Rica says. "The more information you have, the higher the likelihood that eventually you'll be successful."

"Most of the top firewalls offer a comparable level of security," says George Kurtz, a senior manager at Ernst & Young. "It's a function of how well they are implemented." He called firewall certification programs by test labs "baloney" because they can't address how users configure and maintain the products.

Rica says firewall configuration — in which users specify which network services will be permitted and which blocked — must be dictated by corporate security policies. And those policies should be driven by business objectives. "What is the company trying to do on the Internet? Electronic commerce? Web hosting? Just E-mail?" he asks. He advises a conservative approach in which the firewall denies all services except those explicitly turned on by the customer, rather than one in which anything goes except services explicitly blocked.

A simplistic reliance on checklists of features may lead buyers to omit a comprehensive, pre-installation analysis of risks, Stratton says. "I have a concern whether the public is being served by the commodity marketing of this kind of product," he says. "People say, 'We need a firewall,' when what they really mean is, 'We need security against network threats.' They are just buying a product and installing it, and I'm not convinced it's better than nothing in that case."

FALSE SECURITY?

Indeed, a firewall may confer a false sense of security by causing users to overlook flaws in the underlying operating system, particularly Windows NT, Stratton says. "NT has a pretty bad track record, and a terrible track record in terms of staying up," he says.

The denial-of-service attack succeeded because of a flaw in NT that might have been fixed had the user applied the latest Microsoft patches. In addition, some vendors include their own versions of NT networking code in their firewall software in order to address NT's security weaknesses.

Stratton says Unix, the original platform for most of the major firewall products, is at present better than NT from a security point of view. "Just because you have a corporate policy for NT on the desktop doesn't mean you should have it on your firewall," he says.

Adds Schultze, "When some of the Unix vendors ported their firewalls to NT, the feature set was there, but it was residing on top of an operating system that hadn't been hardened." Or, even if it had been fortified against attacks from the outside, it was left vulnerable to insiders' hacks, he says.

Ernst & Young offers a list of 10 things users should do to make NT firewalls more secure (see box, top right).

A firewall may also confer a false sense of security by not safeguarding against the worst threat, says Ira Winkler, president of Information Security Advisers Group in Severna Park, Md., and a consultant to the *Computerworld/Federal Computer Week* firewall exercise. "Firewalls can keep outsiders out and, to a certain extent, keep users from doing stupid things," he says. "The major problem is — and always will be — insiders abusing the system."

Disgruntled ex-employees might delight in bringing down the networks of their former employers via a denial-of-service attack, Winkler adds. "Firewalls aren't just meant to keep attackers out, they are meant to keep a network up and running."

Attend to the basics, such as applying vendors' software patches to fix security vulnerabilities, Winkler advises. "When a new vulnerability is found, it's critical to install the latest security patch on your firewall," he says. "But most administrators do not even know what a security patch is."

Rica advises clients to use the same kinds of scanning tools he used in the attack to find vulnerabilities in their own systems. "We advise scanning from the outside and from the inside network, and scanning and analyzing the underlying operating system the firewall sits on," he says.

Winkler acknowledges that configuring a firewall is a balancing act. "The perfect firewall is a wire cutter," he says. "But a firewall is intended to provide functionality as well as security. The more functionality you provide, the more vulnerability you introduce." □

How to secure an NT-based firewall

- Install latest Microsoft Service Packs and Hotfixes
- Disable Server Service from the external interface
- Disable other unnecessary services
- Don't install the firewall server as a Primary or Backup Domain Controller
- Disable the Auto Admin Log-on feature
- Disable unnecessary "shares" (C$, D$, admin$)
- Disable remote administrator log-on access
- Enable security auditing
- Encrypt the user account database
- Disable remote registry access

These recommendations may not be compatible with all NT-based firewalls. Ernst & Young recommends testing your configuration in a nonproduction environment before implementing it on your firewall.

Source: Ernst & Young LLP

Behind the scenes

The three attack teams used a wide variety of methods, including commercially available and proprietary tools that scan for security vulnerabilities, hacker tools that exploit flaws and manual methods. The sophistication of these tools has grown rapidly during the past few years, making it a challenge for firewall vendors to stay a step ahead. For example, Internet Security Systems, Inc.'s (ISS) scanner now checks for some 340 security flaws.

Federal Computer Week test center director Andreas Uiterwijk installed ISS's RealSecure intrusion detection software to monitor the attack teams' activities. It detailed denial-of-service attacks and intrusion attempts by type and also identified the IP addresses that the attacks came from. He strongly recommends its use and says it provides a more comprehensive audit trail of hacking attempts than the logs produced by the firewalls themselves.

He says the number and variety of penetration attempts and denial-of-service attacks detected by the ISS monitor was "truly amazing."

And it did not, of course, include any new or esoteric hacks not yet programmed into the intrusion detection product.

Uiterwijk worries that given enough time and effort, one or more of the teams eventually would have broken in to internal systems.

Organizations with particularly sensitive data should isolate it on systems with no connection of any kind to a public network, he says.

He also recommends that companies with high security demands enlist the aid of friendly hacker/consultants to examine their systems for vulnerabilities.

Methodology

The *Computerworld/Federal Computer Week* test was conducted against the objections of some major firewall vendors and the International Computer Security Association (ICSA), which works with vendors to test their firewalls. Four vendors agreed to participate, but eight others refused to provide their products. Some nonparticipating vendors said their newest products weren't ready for testing. Most others, and the ICSA, said the tests glorified hacking.

The four firewalls were installed, one at a time for one week each, on a Hewlett-Packard Co. Vectra VL computer running Windows NT 4.0 at *Federal Computer Week*'s test facility in Falls Church, Va.

Behind the firewall was a LAN consisting of four client workstations and a Dell Computer Corp. PowerEdge server running Windows NT. The server ran three network services and held two files for the attack teams to seek.

Other than the network address to attack, the teams were given no information about the environment.

Each firewall was the standard, out-of-the-box model without options, vendor tweaks or modifications, says Andreas Uiterwijk, director of the test center. And each was installed strictly in accordance with product documentation.

For example, all the vendors recommended in their documentation the use of Microsoft Corp.'s latest service pack — in this case Service Pack 3, which contains security features and fixes up to May 13, 1997. However, only one vendor's documentation also recommended installing all security patches released by Microsoft since Service Pack 3.

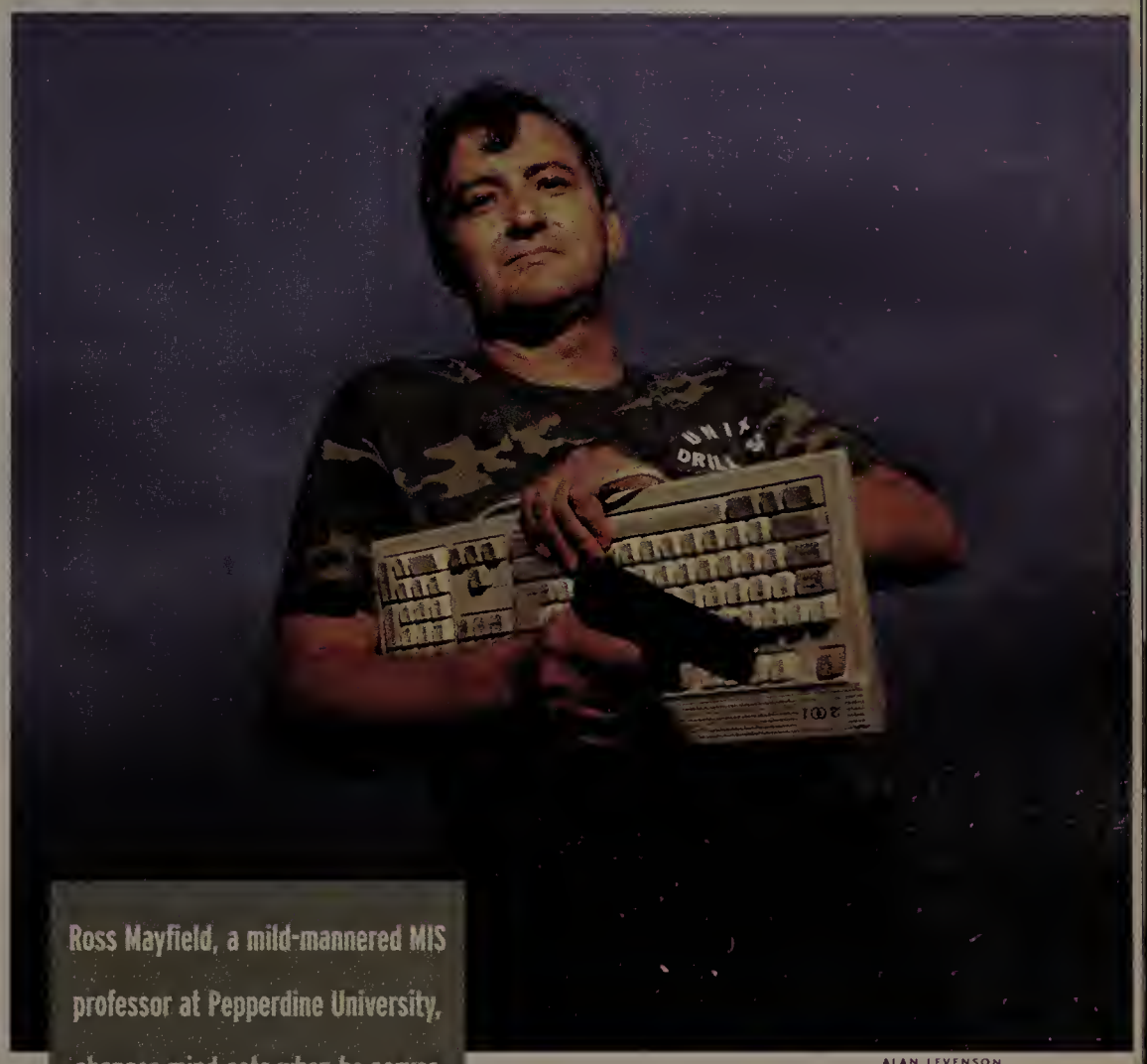
Each of the firewalls employed the conservative approach recommended by experts in which all services are blocked except those specifically enabled by the customer.

Each vendor checked out the test center's installation but made no changes to it, and each provided a small amount of user training.

In Depth

CYBERCOP BOOT CAMP

Police officers trek to a California agency to keep pace with computer criminals



Ross Mayfield, a mild-mannered MIS professor at Pepperdine University, changes mind-sets when he serves as an instructor at SEARCH.

ALAN LEVENSON

By Deborah Radcliff

El Nino gave California a break overnight, pushing the mercury to a suffocating 99 degrees Fahrenheit and rousting a storm of fat, window-splattering insects along Route 50 to Sacramento. Here, at the headquarters of SEARCH Group, 17 shorts-clad officers of the law had traded their guns for PCs for two weeks in June. Some came a long way to do it: from Canada, Idaho — even two from the Chinese Ministry of Justice.

They came to learn the ways of Unix from the cybercriminal's perspective. They would be tutored in little things, such as how to determine a machine's configuration and file contents, and bigger things, such as how to take over a machine remotely, gain root access and search it.

By the end of the week, students would know how to exploit well-known services — such as Telnet, file transfer protocol, browsers, mail and search engines — so they could gain full control of suspect Unix machines remotely. They'd also learn how to track and trace packet headers that lead them to the IP addresses of criminals.

And then they'd learn how to do it all over again — this time on Windows machines.

Ross Mayfield, an adjunct MIS professor at Pepperdine University in Malibu, Calif., is today's instructor. He turns from his projection screen to address the officers, who parrot his commands on their own PCs.

Cybercop, page 67

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CYBERCOP BOOT CAMP

CONTINUED FROM PAGE 65

The students regularly interrupt, query and chatter. "Is that command case-sensitive?" "That's a forward slash, not a back slash."

Mayfield shows them how to dump several commands into a public World Wide Web page form and crash the server. "This Web server is having a really bad day," he deadpans.

Many of the students, such as officer Glenn Sylvester of the San Francisco Police Department and detective Lon Anderson of the Ada County Sheriff's Department in Boise, Idaho, are information technology junkies who have become their agencies' sole certified computer crime experts. They're familiar with Unix and Windows and have taken courses in cyberforensics and how to begin Internet investigations.

"The rise in computer-related crimes and the technology used in these crimes is hard to keep up with. These classes help us with the mechanics; they're like road maps on computer forensics," Anderson says.

The cops are the first to acknowledge they've got a lot to learn. In one exercise, they are attacked from outside (the attacks were preplanned by Mayfield). Systematically, the attacker crashes each PC. Just as systematically, the pupils reboot, not realizing there's a pattern here. Not until the end of the exercise, when all the systems shut down at once, does it occur to them they've been hit.

Students learn how to find server daemons, discover what services are running and drop the server down to level zero.

"They're always astonished, then enlightened by the exercise," says Mayfield, who uses several surprise attacks and exercises.

SEARCH Group, Inc. started out in 1968 as a technical support center to help the U.S. Department of Justice automate and upgrade its systems. Its name stands for System for Electronic Analysis and Retrieval of Criminal Histories. But in 1990, "The nature of the calls changed from, 'Help us automate our systems,' to, 'Help us deal with this seized computer we have,' " says Fred Cotton, the agency's director of training services.

GROWING CURRICULUM

Back then, Cotton and his staff taught themselves the technical methods of seizing and searching microcomputers and then client/server networked equipment. In 1996, Cotton added Internet crimes courses, followed last year by advanced Internet investigation courses. Subjects include Seizure and Examination of Microcomputers, Investigation of Computer Crime and Introduction to Internet Crime (a prerequisite to Mayfield's course).

As technology becomes an integral part of crime, Cotton says SEARCH's courses will continue to evolve.

Last year, SEARCH offered 27 on- and off-site high-tech investigation courses. This year, it's on track to complete 35. After teaching more than 700 trainees last year, SEARCH has worked with "well over 6,000 officers and agents" since the program's inception, Cotton says.

Investigators are hungry for training such as that offered at SEARCH. "We're behind," says Sylvester during a morning coffee break, referring to local police forces. Attendees trying to catch up say they're hampered by budget and regulatory constraints, a lack of support from old-guard management and staffing rotations.

Sylvester's superior, Lt. Lon Ramlan, joins the conversation. Now that he understands the need for IT skills, Ramlan says he's grappling with procedure. "Not only do our inspectors need to learn entire Unix systems in a matter of months, they also must develop and learn correct investigative protocol," he says.

Other cops agree that it's tough to develop investigative procedures while dealing with complex technical issues. "We're not talking about tried-and-tested techniques like those in, say, homicide cases. We must develop entirely new procedures," Anderson says.

Abigail Abraham, an assistant state's attorney for financial and computer crime in Cook County, Ill., who occasionally teaches courses on law at SEARCH, says officers may need to look at cybercrime investigations the way they look at other types of established investigative procedures. To make her point, she discusses homicide.

"The initial cop who takes the report goes to the scene and says, 'He looks dead.' Then they call in evidence technicians to do the blood scrapings, which go to lab technicians for analyzing," she says. "In computer forensics, it's not that different. You bring out someone who's good at preserving electronic evidence, someone else who's good at analyzing it in the lab and so on."

"They're always astonished, then enlightened by the exercise," Mayfield says of the students who take courses at SEARCH.

If there's no such person in a department, she adds, the cops should call another agency for help. That happens all the time in homicide cases.

Mayfield agrees. "Knowing who can solve the problem is often more important than knowing how to solve the problem," he says.

SHARING THE WEALTH

Mayfield is all for spreading his knowledge around. He reasons that with more cops trained in IT, he might not be deputized so often or spend so much time on reserve, such as when he cracked madam-to-the-stars Heidi Fleiss' Windows-based little black book in 1993.

It was an easy case, he says. When the cops took the PC into evidence, they called Mayfield, and he simply opened an unencrypted Paradox database program, which spilled out the names and phone numbers.

More difficult, he says, was a later case that involved more than 60 male prostitutes and 1,000 johns — many of them famous. That time, Mayfield used methods he declines to divulge to crack hardware encryption that plugged in to the keyboard.

"I [ticked] off a lot of johns," he chuckles. "But what I really like is teaching these guys," he adds while gesturing toward the SEARCH laboratory.

ALAN LEVENSON

Then he's back to business, showing his shiny-headed students (most have been on the police force long enough to lose their hair) creative ways to get around Linux boot-level security.

TAKE THE INITIATIVE

"When you're hit with things in the field you've never seen, you must find the solutions in your own head," Mayfield says before installing a Network Intrusion Detector (NID) recently declassified by the Lawrence Livermore Weapons Lab.

Available only to law enforcement, NID not only sniffs packet information as it passes over the wire, but it also analyzes that data for attack patterns, organizes it and shows investigators just the information they need. Other sniffers spit out gigabytes of data, most of it extraneous.

Students at SEARCH also learn how to find server daemons (hidden Unix processes), how to discover what services are running and how to drop the server down to level zero — "the same as killing you with extreme prejudice," Mayfield jokes.

Their brains obviously saturated, the students beg for another break. "This course is very intense," Sylvester says. □

Radcliff is a freelance writer in Northern California. Her Internet address is DeRad@aol.com.

IT Careers

Disabled IT professionals:

Better equipped yet shortchanged

By Gary H. Anthes

Information technology that helps people with disabilities succeed on the job has made huge advances in recent years.

Fortunately, employers generally are willing to make it available to their workers. Unfortunately, the hiring of people with visual, hearing, mental and motor impairments hasn't kept pace with the march of technology. In fact, a recent study suggests that employers are increasingly ignoring that huge pool of job seekers — people who could help ease the IT skills shortage.

And employers often underestimate the capacity and competence of IT employees with disabilities. As a result, employers fail to nurture their careers.

"There's a tendency to not think of the person with a disability as promotable in the same sense as someone without a disability," says Jamal Mazrui, a legislation specialist at the Washington-based National Council on Disability. "It's like, 'Oh, we figured out a way for this person to do this job, so why complicate the picture by talking about other things?' "

Mazrui, who is blind, knows from experience. Formerly a database administrator at Harvard University, Mazrui says, "I found that when there were new projects that came up, I just wouldn't be someone that was thought of." He should have been more aggressive in demanding new responsibilities, he says.

Wade Churchfield lost the use of his legs in an accident 13 years ago, when he was a systems analyst at Duquesne Light Co. in Pittsburgh. He became the company's first IT employee with a disability, and his use of a wheelchair was career-inhibiting at first, he says.

Duquesne was "very willing to make whatever accommodations I could identify," he says. "The problem was, I was reluctant to identify them; I was just so happy to have a job.

"I let them make decisions for me that really were not good for me," Churchfield says. "They overprotected me." For example, he wasn't allowed to go to computer conferences in other cities because it was deemed unsafe and too difficult.

MORE INDEPENDENT

"Everyone can benefit from IT, but people with disabilities have benefited more than any other group because of the increased independence and improved quality of life it gives them," says Larry Scadden, director of programs for persons with disabilities at the National Science Foundation in Arlington, Va.

Scadden, who is blind, cites several breakthroughs that revolutionized his use of computers. He uses speech synthesis and output for some applications and a braille output device for others. He also listens to paper mail and documents after reading them into his PC via a desktop scanner. Scadden hails recent developments in graphical user interfaces, which are becoming accessible to the visually impaired via speech synthesis and braille. He also cites major progress in the accuracy of speech recognition — at very affordable prices — as a boon to people who are unable to use a keyboard for input.

Speech recognition has made the workplace fully accessible to Mark Harmon, who was paralyzed below the neck when his motorcycle struck a tree in 1975.

An independent living specialist at Unum Corp., a Portland, Maine-based insurance conglomerate, Harmon runs a service that offers advice to people with disabilities via E-mail, telephone and the World Wide Web.

Harmon uses the accessibility options in Windows 95 plus the voice-activated DragonDictate from Dragon Systems, Inc. in Newton, Mass., to control his PC and navigate among his applications. He uses Dragon's NaturallySpeaking to create E-mail and documents. "There's incredible technology out there now," Harmon says. "I stopped writing in 1975. Last October, I got DragonDictate and started writing again."

Mazrui uses screen-reader and speech-synthesis software as his interface to word processing, E-mail and various online services. He says employers today generally are willing to make the investments in those IT tools for people already on the payroll.

But he says employers are much less inclined to seek out and hire people with disabilities.

"The employer often will assume the person couldn't possibly do the job because [employers] don't know what technological solutions exist," he says. "Or they may say, 'If I hired this person, I'd have a start-up cost buying this equipment of $1,000 or $2,000.' "

According to a 1995 Harris Poll, 81% of employers said they had made accommodations for employees with disabilities, up from 51% in 1986. But in a Harris Poll published in July, the National Organization on Disability reported that although 79% of

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nondisabled adults of working age are employed, only 29% of those with disabilities have full- or part-time jobs. The trend is troubling; a similar survey in 1986 showed a 34% employment rate for people with disabilities, or 17% more than are working now. There are an estimated 54 million Americans of all ages with disabilities.

People with disabilities say companies are doing better in providing for their needs, possibly because of the requirements of the Americans with Disabilities Act (ADA) of 1990. The July Harris Poll showed a decline from 49% in 1994 to 40% today in the number of disabled workers who say employers are insensitive to their needs. Still, four in 10 said in the most recent poll that they have encountered job discrimination. One-third said they have encountered "unfavorable attitudes" toward their disabilities on the job, virtually unchanged from 1994.

"In general, expectations are not as high as for a nondisabled employee, so employers may not challenge the [disabled] person," Churchfield says. "If you are not happy with what you are doing, you have to speak up."

Seeing his career stall after his accident in 1985, Churchfield finally did speak up. "Once we came to an understanding that I needed to make the decisions on what I could and couldn't do, I got promoted three more times," he says. "In fact, they actually created a senior-level technical position just so I'd have a career path."

A lack of career development for people with disabilities may be reflected in figures from the U.S. Bureau of the Census, which reported in 1995 that men without disabilities made on average 21% more than disabled male workers. That gap had widened since passage of the ADA. For women, the disparity was 16%.

"I expect to work a little harder than anyone else, but I don't begrudge that. I'm glad I have the opportunity to do it and a company that gives me the opportunity to do it."

– Mark Harmon, an independent living specialist at Unum Corp., who was paralyzed below the neck in 1975, shown here with his son

EMPLOYER RESISTANCE

Employers sometimes resist hiring people with disabilities out of fear they won't be able to do the job yet will be impossible to fire, Scadden says. "There's this tremendous shortage of IT professionals. But the IT managers are afraid the head of human resources or an insurance company will object to hiring someone with a disability," he says. "It's much easier to just hire someone else."

But some employers don't see it that way. Three years ago, Joyce Bender started Bender Consulting Services, Inc., a for-profit outfit in Pittsburgh, with 30 employees, 28 of whom are programmers or network engineers with disabilities. Churchfield now manages a staff of seven in Bender's company.

What's needed in the workplace, Bender says, is education for the nondisabled. "Sometimes people with disabilities are excluded out of fear or ignorance," she says. She also advises employers to establish mentoring programs for entry-level employees with disabilities.

For the disabled job seeker, Bender advises surfing the 'net. In particular, she recommends the Web site of the President's Committee on Employment of People with Disabilities (*www.pcepd.gov*), which has links to some 60 large organizations that have expressed interest in hiring people with disabilities.

Scadden advises employees with disabilities to stay abreast of the fast-changing marketplace of accessibility tools. And he stresses not to hesitate to demand them from employers. "I put the burden on the employee as much as the employer to know what to buy," he says.

Gregg Vanderheiden is the director of the University of Wisconsin's Trace Research and Development Center, which is exploring ways to make computing/communications technology accessible to all. He acknowledges that people with some disabilities can't physically work as fast as those without disabilities. "The thing to do is not to compete with quantity, but with quality," he says. "Quality and reliability are so valuable that [employers] will be less concerned with volume. I expect to work a little harder than anyone else, but I don't begrudge that," Harmon says.

"I'm glad I have the opportunity to do it and a company that gives me the opportunity to do it," he says. □

Anthes is Computerworld*'s editor-at-large.*

MOREONLINE

For more information on articles, books, assistive technologies, resources and organizations for the disabled, visit *Computerworld online*.

www.computerworld.com/more

Anytime + anywhere = anyone

IT users with disabilities soon will reap big rewards from trends in mobile computing and communications, says Gregg Vanderheiden, a professor of human factors and industrial engineering at the University of Wisconsin in Madison.

And road warriors will enjoy the fruits of IT developed for people with disabilities, he says.

Vanderheiden describes how one day he might be at his desk typing a memo on his PC. He has a plane to catch, so he switches to voice input as he continues his work on a pocket-size computer in his car.

Caught in slow traffic, Vanderheiden realizes he'll miss his flight. Aided by speech input and output technology, he checks the airline's Web site for flight schedules, looks up several phone numbers, places the calls, checks his calender and sends E-mail — all with little or no visual or physical contact with his computer.

Later, in a meeting or on a noisy flight, he can do all the same things without having to hear his PC.

"If I can do this, a person who is blind can do it and a person who is deaf can do it," Vanderheiden says.

"The formula is called 'triple A' — anytime, anywhere, anyone," he says. By the time you have interfaces that can be used anytime and anywhere, you basically have all you need for an 'anyone' interface."

— Gary H. Anthes

CLIFF KUCINE

COOL CAREER SITES

Helpful Internet resources for IT contractors and consultants

BY LESLIE GOFF

GENERAL RESOURCES

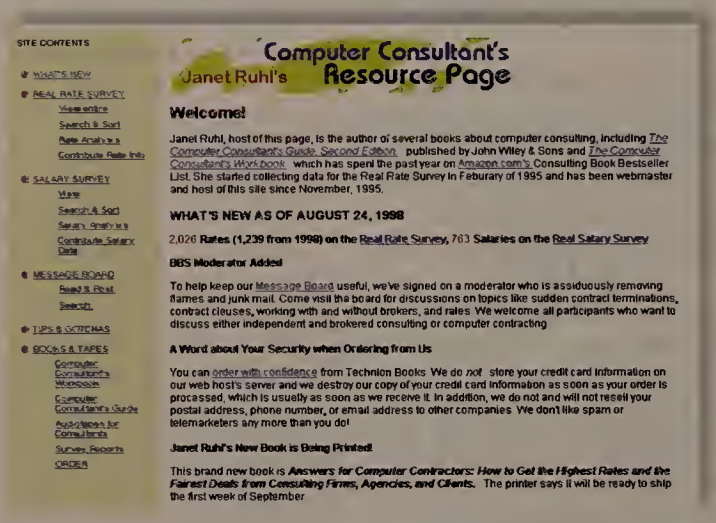
Janet Ruhl's Computer Consultant's Resource Page

www.javanet.com/~technion/index.htm

This site is updated weekly by consulting guru Ruhl, the author of several books, including *The Computer Consultant's Guide* and *The Computer Consultant's Workbook*. It's one of the best places to touch base with your peers and get a reality check on the ins and outs of information technology contracting and consulting.

You can compare how well you're doing by searching the 2,000-plus hourly earning rates of your peers. Display all of the 1998 listings or look for rates by technical specialty, location or job description. You also can contribute your own data to the survey.

An exceptionally active message board contains real-world questions and advice such as "How do you politely let your client know you're a peer, not a subordinate?" That sparked a lively — at times controversial — discussion last month. Peruse the postings for indispensable tips on negotiating rates, how much to pay to meet the requirements of the Federal Insurance Contributions Act and more. If you're interested in a particular topic, such as how to handle a sticky political situation, search by keyword.



A "Tips & Gotchas" page features information such as how to tell if you're interviewing with a "body shop" (a large-scale outsourcing firm or contract placement firm), what you can deduct on your income taxes and how to find clients. Although a "Consulting Firm Hall of Shame" is now defunct and the offending agencies' names removed, unethical practices are still posted as road signs to be wary of. For instance, recruiters who ask for your references before they offer you a job may be interested only in building up their contact database.

CPUniverse: The Online Resource From *Contract Professional* magazine

www.cpuniverse.com/cpumain.html

Unfortunately, you can't get the current issue of this magazine online — only its table of contents. But the site is still worthwhile for its other features. There's the "So You're New To This" section, with articles on how to break the $150,000-per-year barrier, protecting yourself from lawsuits, the pros and cons of incorporating and more.

"Forum" includes a bulletin board and weekly hot topic. A telecommuting discussion that started in May was still going strong last month. The weekly news section is OK, but the archives of magazines from the past two years are better. Search for articles by keyword or scan the tables of contents by issue. The magazine is full of fine how-to articles, trends and tips. The "Resources" section links to professional organizations, training firms, conferences, job fairs, agencies and more. For a diversion, check out the cartoon, movie reviews and fun links in the "Procrastination" section.

Contract Employment Daily

www.cedaily.com/menu.html

Here's a bounty of bulletin boards that address various topics of interest to consultants. Unfortunately, not all of them are updated regularly. Best bets are "Shop Talk," which addresses workplace issues; "IRS and Legal," a discussion of tax and liability issues; "Industry Buzz," with news of layoffs and other rumors; and "Horror Stories," where users share their worst experiences.

Also check out the listing of rates, arranged by client and job description. But for the most recent rates, scroll to the bottom. □

Goff is a freelance writer in New York.

WHERE TO FIND CONTRACT WORK

ComputerWork.com Job Board and Resume Bank: The Continuing Resource for Computer Contractors and Professionals

www.computerwork.com/

This excellent site is perhaps most useful to IT consultants and contractors looking for their next big gig. It stands out from the others for its ease of use and localization. It features separate pages for 35 cities and regions, including smaller cities such as Nashville, Memphis, Cincinnati, Indianapolis and Charlotte, N.C.

Search for jobs by date, keyword or job description using the intelligently constructed, menu-driven form. Respond to jobs online. If you aren't interested in a job for yourself, one click sends it off to a friend. Submit your resume at the national home page to have jobs matching your skills keywords delivered to you personally by a job search agent. A moderated "User Forum," which requires registration, is sporadically updated; most of the discussion is a debate over the demand for IT professionals. You can also search for agencies by location.

Contract Employment Weekly

www.ceweekly.wa.com/

More than 6,000 jobs are listed here, and there's a lot more, such as a regional online job fair and a substantial listing of links to information pertinent to contractors. It includes such issues as temporary housing, taxes, travel assistance, training, industry associations and more. Subscription is required for full site access, but many worthwhile features are available to nonsubscribers.

ContractJobs.com: Home of the Professional Technical Contractor, Consultant

www.contract-jobs.com/

Search for jobs by keyword or job description using an easy, straightforward form. It yields a range of satisfactory, up-to-date job listings. This site commits one sin of omission, however — you can't search by date. Skip the "Resources" section, a listing of supposedly new titles from Amazon.com that hasn't been updated since the spring.

CAREER Watch

Luring Canadian pros

Looking north for scarce IT skills? Here's a TN-1 visa primer on how to snare professionals from Canada:

•To apply for a TN-1: Submit an "official-looking" letter of employment at the border.

•Initial duration of visa: One year maximum. Frequent renewals required.

•Limit on renewals: None.

•Forms required: None.

•Processing time: Instant approval.

•Eligibility requirements: Must be a Canadian citizen, be engaged in business activities at a professional level and have a bachelor's degree and relevant experience in the field. For more information, visit the TN-1 NAFTA Home Page at *www.grasmick.com*.

Whither women?

Are fewer women earning bachelor's degrees in computer science? "New" studies don't help answer that question because they still offer old data. A study just released by Tracy Camp, a professor at the University of Alabama, says the peak year for female computer science graduates was 1983-84, when women earned 37.1% of the bachelor's degrees in computer science. In the 1993-94 academic year, that percentage had dwindled to 28.4%.

Be true to your school

The best way to produce more IT workers is to introduce high school students now to what IT work is all about. In this week's Online IT Careers feature, Susan Yule outlines how businesses can partner with local schools to set up mentoring programs. Visit our Web site at www.computerworld.com/careers.

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Data Architect

Ensures that Sprint PCS systems are designed and configured to optimally support the company's information systems. Requires 7+ years systems experience in data planning, analysis, design and implementation. Must have demonstrated knowledge of sophisticated, complex data technology solutions, industry standards and data management methodologies. Skills required include data requirements gathering, logical data modeling, use of CASE tools for data modeling, packaged application data structure analysis, and reverse engineering. **Job Code: CW/DA**

Database Administrator

Ensures Sprint PCS Database Management Systems (DBMS) are selected and configured to optimally support the company's DBMS-based information systems. Qualified candidates will have a minimum of 5-7+ years information systems experience in database planning, analysis, design, implementation and production support. Oracle experience required. **Job Code: CW/DBA**

DB2 Database Administrator

Ensures Sprint PCS Database Management Systems (DBMS) are selected and configured to optimally support the company's DBMS-based information systems. Qualified candidates will have a minimum of 7+ years information systems experience in database planning, analysis, design, implementation and production support, as well as 3+ years of VLDB experience on parallel IBM SP2 platform utilizing UDB and/or DB/2 DBMS. Telecom experience a plus. **Job Code: CW/DB2DA**

Senior "C" Programmer

Defines system scope and objectives, preparing detailed specifications that encompass business processes, information flow, risk analysis, timelines, cost/benefit analysis, probable platforms and impact analysis. Responsibilities include analysis of interfaces, and how to remove interfaces by utilizing data layers. Must have in-depth knowledge of business processes. Qualified candidates will have 5-7+ years experience, with a strong telecommunications background, computer application development, process knowledge and formal SDLC methodology (such as Method/I) expertise. Bachelor's degree preferred. **Job Code: CW/SPC**

Technologist

Primarily responsible for developing the short-term and long-term strategic plans for the evolution of information technologies within Sprint PCS as well as developing the solution-set technology components of the IT architecture. You will work within cross-functional teams of internal and external IT professionals requiring excellent interpersonal and presentation skills as well as the ability to communicate complex technical data and concept using standard business terminology. A high energy level, practical experience, creativity and the ability to grasp new concepts quickly are all essential to holding this position. Must have information systems knowledge which covers the spectrum of mainframes, client/server, Unix systems, data, voice, video and satellite networks. Bachelor's degree required as well as working IT experience in an operating environment; MBA a plus. **Job Code: CW/TECH**

System Administrators - Unix
Sr. Systems Administrator - Unix

Performs activities to maintain, configure, and support the corporate business and telco switch systems as required to perform upgrades to the operating systems, databases, and third-party applications. Develops work plans for migrations and upgrades; and, shares responsibilities for all production, development, and systems supporting telco switches. Works closely with team members to perform component, operating system, file system and other configuration enhancements to optimize the corporate production systems. Technical degree and a minimum of 3 years experience in systems administration. Ability to use the system account report (SAR/SAM), and to author shell scripts required. **Job Code: CW/SSA-U**

Platform Engineer

Responsible for determining platform operation requirements, assisting in projecting platform portion of network traffic, and addressing specific platform related issues. Will translate user system needs into specific platform configurations based on requirements, network impact and budget constraints. Knowledge in design engineering, hardware/software implementation process and strategic and tactical technology development direction required. **Job Code: CW/PE**

Technical Architect

Provide technical leadership and guidance in the determination of technologies, interfaces, and vendors during the design and development of Sprint PCS business systems solutions. Responsible for project adherence to enterprise standards, scalability, flexibility, and visionary completeness of system solutions. A degree in computer science, engineering, or information systems is desirable, as well as experience in telecommunications. **Job Code: CW/TA**

Sr. Technologist - PeopleSoft

Primarily responsible for developing the solution-set technology components of the IT architecture; defining scope of the evolution of the application architecture and standards, determining working policies for PeopleSoft solutions/initiatives, serving as advisor to IT management on architecture and standards.You will work within cross-functional teams of internal and external IT professionals requiring excellent interpersonal and presentation skills as well as the ability to communicate complex technical data and concept using standard business terminology. A high energy level, practical experience, creativity and the ability to grasp new concepts quickly are all essential to holding this position. Must have information systems knowledge which covers PeopleTools I, II: PeopleCode; SQR, SQL; Oracle DB; and at least four of the following modules - AR, AP, GL, PC, PR. Other skills preferred: C/C++, Unix and Unix scripting, NT, WIN95, MS Office, LAN, e-mail. Bachelor's degree required as well as working IT experience in an operating environment; MBA a plus. **Job Code: CW/SRTECH-PS**

Systems Analyst - Sr. Systems Analyst

Serves within the systems development group, working closely with assigned systems analysts, client functional groups and business teams to define work processes and develop IT solutions. Unix, C, SQL, PeopleSoft, and/or Oracle Developer 2000 desired. **Job Code: CW/SA-SSA**

Business Analyst - Sr. Business Analyst

Serves within the business analysis group, assigned business analysts, client functional groups and technical teams to define work processes and develop IT solutions. Requires computer application development process knowledge and relevant experience using a formal SDLC methodology (such as Method/I). **Job Code: CW/BA-SBA**

Network Systems Engineers
Sr. Network Systems Engineers

Responsible for procurement and delivery of Network Administrative Systems Planning; design, development and implementation of SCP AIN services; WAIN Planning; design, development of specifications for SCP and SMS based applications to include HLR, AC and OTAF Planning, design, development for voice mail system, wireless data and messaging applications. Knowledge required with IS-41, INC, MSC, Systems Engineering, Provisioning Architecture, Local Number Portability, Cellular Digital Pack Data and Cellular Circuit Switched Data. 3-10+ years experience in system analysis, design, development, program management, telecommunications, AIN or WIN systems, SS7 messaging, IS-41, CDPD, Circuit Switched Data and other Data Protocols. 3-5+ years with MSC call processing logic. BSCS or BSEE required; MSCS or MSEE with emphasis in telecommunications system experience and/or management desirable. **Job Code: CW/NSE/SNSE/SBP**

Manager - Application Delivery

Responsible for managing ongoing development of application systems within various areas of SPCS. Requires 8-10 years IT experience in a client/server environment with a minimum 3-5 years in a managing capacity. Must have a strong working knowledge of application systems software development-integration life-cycle methodology and familiarity with business processes. A four year degree or equivalent work experience is also required. MBA or equivalent is preferred. **Job Code: CW/MAD**

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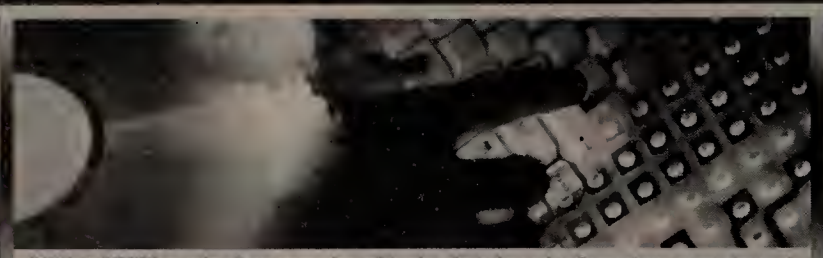
Information Systems Senior Associate needed for Cincinnati area company. Duties include: Planning, monitoring and executing the efficient design and implementation of interface conversion programs and modifications to the Systems, Applications, and Products (SAP) in Data Processing in R/2 and R/3 in the modules of SD (Sales and Distributions), MM (Materials Management), SM (Service Management) and FI/CO (Finance and Accounting). Develop solutions, applications and configurations for conversion programs, provide testing and documentation. Supervise technical installation of the SAP system within the framework of projects or departments maintaining existing SAP software systems. Job requirements: Bachelor Degree or equivalent* with major field of study in Business Administration or Computer Science; minimum 2 years experience in job described or 2 years experience as Computer Programmer** (*Equivalent may be Foreign Credential Evaluation in lieu of degree.) (**Experience must be in SAP.) 40 hours/week. Monday through Friday, 8:30am to 5:00pm; $75,000/year. Send 2 resumes and cover letters (no calls) to: Es SP **Prgms, REF# 4022D, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.** EOE

Software Engineer [Multiple Openings] - Use simulation techniques to design & develop integration software for a database environment. Perform requirements analysis, design, development & testing of communication modules in SAP/ABAP & C language. Analyze, design, develop & test software tools that will simulate communication between database and systems. Gather, study & review systems software needs. Must have Bach deg in Math, Comp Sci or Engring + 1 yr exp in the job offered or 1 yr exp as Electrical Engr or Comp Engr. Must have 1 yr exp w/C language & processing simulation software. 40hrs/wk. $63,960/yr. Apply at the Texas Workforce Commission, DALLAS, Texas or send resume to the Texas Workforce Commission, 1117 Trinity, Rm 424T, Austin, Texas 78701. JO# TX0611509. Ad paid by an Equal Opportunity Employer.



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Software engineer with 2 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using Oracle, Developer 2000, and HTML. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer science or physics. $58,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 8040999, to: Mr. Stan Majesky, Manager, Greene County Job Center, 653 East High Street, Wayesburg, PA 15370.

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Software engineer with 3 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 3 years of experience using C and software development for embedded systems. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer applications or physics. $66,500/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 7040877, to: Mr. John McCraley, Manager, Butler County Job Center, 227 West Cunningham Street, Butler, PA 16003.

Information Systems Senior Associate needed for Cincinnati area company. Duties include: Manage the planning, monitoring and executing of the efficient design and implementation of interface conversion programs and modifications to the Systems, Application and Products (SAP) in Data Processing in R/3. Provide the technical implementation in the modules of SD (Sales and Distribution) and MM (Materials Management). Develop solutions, applications, and configurations for conversion programs, provide testing and documentation. Manage overall implementation projects, supervise technical implementation of the SAP system within the framework of projects or departments maintaining existing SAP software systems. Provide profitability analysis for all new projects and contracts. Utilize ARIS toolset for analysis and feasibility for Business Process Reengineering in SAP R/3. Job requirements: Bachelor Degree or equivalent* with major field of study in Information Systems or Computer Science; minimum 2 years experience in job described or 2 years experience as Computer Programmer** (*Equivalent may be Foreign Credential Evaluation in lieu of degree.) (**Experience must be in SAP.) 40 hours/week. Monday through Friday, 8:30am to 5:00pm; $75,000/year. Send 2 resumes and cover letters (no calls) to **ES Sp Prgms, REF# 4021D, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216.** EOE

Senior Software Engineer: Design, develop & implement a new generation of client/server based document management systems using object oriented technologies with C++ programming, distributed processing, program design & interfacing with SQL databases. Research, analyze, design & implement a multi-user server capable of managing enterprise wide documents. Provide technical supervision & management to 3-4 software engineers working as part of the document server development team. Coordinate the design & implementation of various modules of the document server. Oversee design & code review, test plan development, product releases & project documentation. Track software defects, perform bug fixes & ensure quality assurance. Must have a Bachelor's degree in Computer Science. Must have five years of experience in the job offered or as a Software Engineer. Must have completed at least one professional project in each of the following: 1) Object Oriented technologies with C++ programming; & 2) Client/server based system design & implementation interfacing with SQL databases. 40 hrs/wk, 9:00 am - 5:00 pm. Overtime required as needed. $80,000/yr. Overtime pay exempt. Must have proof of legal authority to work permanently in the U.S. Send resumes to the ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street - 7 North, Chicago, Illinois 60605. Attention: Arlene Thrower. Reference # V-IL 19429-T. AN EMPLOYER PAID AD. NO CALLS - SEND 2 COPIES OF BOTH RESUME & COVER LETTER.

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Software engineer with 2 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 2 years of experience using PERL, AWK, TCP/IP, C, C++, and HP-Unix. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer applications or physics. $57,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 5020414, to: Mr. James Woods, Acting Manager, Pittsburgh East Job Center, 6206 Broad Street, Pittsburgh, PA 15206.

Software engineer with 1 year of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, with 1 year of experience using SAP. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer applications or physics. $125,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 2020612, to: Local Office Manager, MonValley Job Center, 345 Fifth Avenue, McKeesport, PA 15132.

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Software engineer with 1 year of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, requiring supervision of other computer professionals, with 1 year of experience using Oracle Applications, Developer 2000, and Windows NT. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Master's degree in one of several limited fields: engineering, mathematics, computer applications or physics. $65,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 9087057, to: Mr. Ron Marsh, Manager, Alle-Kiski Job Center, 3 Kensington Square, New Kensington, PA 15068.

Data Base Administretor [5 Openings] [J.O.N. 7040353] Database administration in Oracle; coordinating physical changes to Oracle databases, and coding, testing and implementing physical databases, design logical and physical databases and establish physical data base parameters; performance tuning of Oracle database management system. Reqs. a Master's Degree in Computer Sci., Systems Analysis, Computer Information Systems, Computer Engg., Electrical Engg., Electronic Engg., or Mathematics or its equivalent in educ. and exp., and 3 yrs. exp. in the job offered. Will accept a Bachelor's degree, or a foreign equivalent degree, followed by at least 5 yrs. of progressive exp. in the specialty, in lieu of the required educ. and exp. 40 hrs./wk., M-F, 9a-5p, $77,000.00/yr. Send resume along with J.O.N. to Mr. Tom Dembosky, Manager, Indiana Job Center, 350 N. Fourth St., Indiana, PA 15701.

Software Consultant [J.O.N. 6020208] [10 Openings] Consult with clients to define their data processing and computer systems needs; analyze clients' current procedures; recommend and implement software and hardware solutions; and use IMS DB/DC, PL/1, and TELON. Reqs. a Master's Degree in Computer Sci., Systems Analysis, Computer Engg., Computer Information Systems, Computer Application, Electrical Engg., Mechanical Engg., Civil Engg., or Math or its equivalent in educ. and exp., and 3 yrs. exp. in the job offered. Will accept a Bachelor's Degree or a foreign equivalent degree, followed by at least 5 yrs. of progressive exp. in the computer software specialty in lieu of the required educ. and exp. 40 hrs./wk., M-F, 9a-5p, $55,229.20/yr. Send resume along with J.O.N. to Mr. Clement Pizzutelli, Manager, Connellsville Job Center, 1051 Morrell Ave., PO Box 868, Connellsville, PA 15425.

Software engineer with 5 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical analysis, requiring supervision of other computer professionals, with 5 years of experience using TCP/IP, Unix, C, and relational datebases such as Informix and Oracle. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: business, engineering, mathematics, computer applications or physics. $80,000/yr. 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 7040902, to: Mr. Greg Schwing, Manager, Pittsburgh South Job Center, 2100 Wharton Street, Pittsburgh, PA 15203.

Software engineer with 5 years of experience as a s/w engineer or computer professional, who will develop s/w systems, applying computer science, engineering, and mathematical anelysis, requiring supervision of other computer professionals, with 5 years of experience using Windows, C, C++, with et least 3 years of experience with Java and Windows NT. Analyzes s/w reqs. and performs testing and user training after development. Extensive travel and frequent relocation. Bachelor's degree in one of several limited fields: engineering, mathematics, computer science or physics. $70,000/yr 40 hours/wk., 9:00 am - 5:00 pm. Send resumes, listing job order number 7040876, to: Ms. Charlene Cogley, Manager, Beaver Falls Job Center, 2103 Ninth Avenue, Beaver Falls, PA 15010.

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■ Software Engineers

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SENIOR SQFTWARE DEVELQPER: Design and develop client/server applications in open environment including designing and developing GUI, functionality and database, performance systems analysis and designing, developing and testing customized systems. Analysis, design and development of three-tier object oriented client/server communication systems. Analyze and design business processes through data modeling and process modeling. Requires: BS in Computer Science and 1½ years experience in developing 3 tier client/server systems. Knowledge of C programming in UNIX environment including distributed programming using Remote Procedure Calls. Skill in Database Administration services for QRACLE, Qracle PL/SQL programming, and UNIX Shell scripting. Ability to develop GUIs in Visual Basic and in connectivity tools including ODBC. Good communication skills. 40 hrs/wk (9 to 5); $53,000/yr. Send 2 resumes/respond to: Georgia Department of Labor, Job Order # GA 6272923, 2943 N. Druid Hill Rd., Atlanta, GA 30329 or nearest Department of Labor Field Service Qffice.

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Mainframe experience is preferred. Relational or object-oriented database management systems is required. Good organizational skills a must. Clear and strong written and verbal communication skills are essential. BA or equivalent in computer related discipline and 2-3 years of related experience preferred. Experience with COBOL, SOL, SQR, Qracle and SCT Banner system are desired. Salary: $30,000 - 45,000

Send letter of interest and 3 references to:
Michael Vande Velde
Assistant Director of Computing Services
116 Maytum Hall
SUNY College
Fredonia, New York 14063

Review of applications begins September 15, 1998 and will continue until the position is filled.

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Programmer/Analyst (Client site in Tampa, FL) Analyze, design, develop, code, test, implement and maintain programs for financial and commercial applications systems using RPG/400 in an IBM AS/400 environment. Bachelor's Degree in Comp. Sci., Engin., or Math, + 2 yrs. exp. req. $36,500/yr; 40hr/wk; 8:30 a.m.-5 p.m. Send resume to: Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869, Re: JO# FL-1844087.

PROGRAMMER/ANALYST. Responsible for SQL software development expertise including Sybase SQL Server Application Development using stored procedures & triggers & report development using the SQR language. Will work closely with Line of Business (LOB) Analysts to evaluate requirements and database design and will be responsible for program specification, coding & documentation. Qualif. applicants must have a Bachelor of Science degree in Computer Science or Related Field and one & a half years of experience in the job offered. Hours: 8 to 5. Salary $45,000.00 per year. Only persons authorized to work permanently in the United States need apply. Please forward resume to Ms. Jane Hosley, #KY0369616, Kentucky Department for Employment Services, 275 E Main St. 2-W, Frankfort, Kentucky 40621. An equal opportunity employer.

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Will analyze, design, code and tests programs for business applications and develop business solutions within the IS infrastructure. Individuals will provide programming support for software applications and assists on project management tasks. Qualified candidates will possess a Bachelors degree in Computer Science and 3-5 years of RPG and CL programming experience. Excellent problem solving and communication skills are required as is the ability to multi-task and to work both independently and within a team. **Code: CW/ASA**

AS/400 SYSTEMS PROGRAMMER

Will install, upgrade and maintain OS/400, Communications Network and DB/400 Database Administration at multiple locations. Individual will provide support for the daily operation of local and remote data centers. Qualified candidate will possess a Bachelors degree in Computer Science and 3-5 years OS/400 operating system experience. Strong CL programming experience is a plus. Individual must have excellent problem solving skills and be able to multi-task. Some travel is required. **Code: CW/ASP**

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Will provide programming support for Client Server and Internet applications as well as develop and test programs for business applications and implement business solutions within the IS infrastructure. Qualified candidate will possess a Bachelors degree and a minimum of 3-5 years programming experience in Object Oriented Development Tools and previous experience supporting remote users. Knowledge of Borland Delphi 3.0, Microsoft SQL Server 6.5, Borland Interbase database engines is required. Experience in developing systems in a network environment is required along with excellent communication and problem solving skills. Knowledge of Rational SQA Team Test Suite and Internet/Intranet development skills is a plus. **Code: CW/DA**

CLIENT SERVER DATABASE ADMINISTRATOR

Will support, develop, analyze and design application data bases using MS SQL Server Database. Qualified candidate will possess a Bachelors degree and a minimum of 3-5 years experience in relational database support and performance tuning. Knowledge of Windows NT, TCP-IP, SQL Query is required along with excellent communication and problem solving skills. Knowledge of DB2/400 and replication tools is a plus. **Code: CW/CS**

HELP DESK/PC SYSTEMS ANALYST

Will provide first level technical support to both local and remote PC End Users. Individual will install, upgrade and maintain both hardware and software, perform hardware diagnostics and resolve problems with PC software packages, primarily Windows 95, Windows NT and Microsoft Office Suites. Knowledge of both Token Ring and Ethernet LAN connectivity in a Microsoft NT Server environment is required. Individual must be able to prioritize work flow to minimize End User Down time and be able to work independently and within a team. Qualified candidate will possess a Bachelors degree in Computer Science and 3-5 years of related work experience. **Code: CW/HD**

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Senior Systems Analyst required by Insurance Co. in Phila. PA. Must have 1 yr exp dvlpg s/ware reqmts for major business info systms using IBM Enterprise systms, UNIX, PCs, Powerbuilder, DB2, Tuxedo Oracle, C, C++, Cobol, JCL, TSO, CICS & LAN technology. Bachefors or equiv. in Comp Sci, Math or related field reqd Apply by resume to: Manager-IS Claims, Independence Blue Cross, 1901 Market St, Philadelphia, PA 19103-1480.

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i) Software Engineer - Must have exp dsgn/dvlp/implmtg using UNIX, C, Pro*C, SQL, ORACLE; & test ORACLE form applics; & create reports using C & Pro*C.

ii) S/ware System Testing Prgmr - Must have exp. dvlpg test plans & cases using COBOL, JCL, IMS DB/DL & VSAM.

Send resumes to: Global Consultants, Inc. 601 Jefferson Rd., Parsippany, NJ 07054.

PROGRAMMER/ANALYST wanted F/T by Computer Services Co. in Cranford, NJ. Must have 1 yr exp dsgng & dvlpmt of object oriented computer applics incl d/base dsgn using 4GL, C++, CA-Clipper & Visual Basic under client/server architecture w/SQL d/base incl multi-format d/base conversion & internationalization of s/ware. Bachelors in Comp Sci, Comp Engg or Elect. Engg reqd. Respond to: HR Dept., Unicom Sales Assoc. Inc., 777 Walnut Ave., Cranford, NJ 07016.

Software Engineer. $60K/yr. 8am-5pm; 40hr/wk. Analyze, dsgn, dvlp & prgm systm & Object Oriented s/ware applics using Data Modeling Tools, OOA, OOD, OMT, Visual C++ & the server in back-end developed in Informix- 4GL. To process data thru SMUDGE (Synchronous Message Utility Definition/Generation Environment) in 'C' pckge. Dvlp DLL's in Visual Basic C++; Dvlp applic interface in Visual C++ 4.2/5.0; RPC's for SMUDGE to interface w/INFORMIX server & dvlp INFORMIX-4GL & ESOL/C prgm to process data in the server on Windows'95 & NT, HP9000 running HP-UX 10.0 using Visual C++5.0/4.0, Java, INFORMIX-ESOL/C & 4GL & SQL, and C s/wares. EDUCATIONAL REOUIREMENT. Masters or Equiv degree w/major field of study in Comp Sci or Engg; or Electronics or Electrical engg. EXPERIENCE REOUIREMENT: 1 yr exp in job offd or in related occup of Systms or Prgmr Analyst. SPECIAL REOUIREMENT: Educational qualification & 1 yr work exp documents must show use of skills in Object Oriented s/wares, Data Modeling, Object Oriented Analysis (OOA), Object Oriented Design (OOD), Object Modeling Technique (OMT), Visual C++, C++, Java, C, Informix, Oracle, Windows'95 & NT & Unix. Job loc - Atlanta, GA. Send resume or apply in person at: GADOL, JO # GA6271045, 2943 N. Druid Hills Rd., Atlanta, GA 30329 or nearest Dept of Labor Field Service Office.

PROGRAMMER/ANALYST Tampa, Florida. Duties: plan, develop, test, document computer programs, using programming techniques and computer systems; evaluate user request for new/modified programs to determine feasibility, cost and time required, compatibility with current system and computer capabilities; consult with user to identify current operating procedures and clarify program objectives; formulate plan required to develop program, using structured analysis/design; converts project specifications with flowcharts/diagrams, into sequence of detailed instructions and logical steps for coding into language processable by computer. Utilize programming, unit testing, and the system design/development/implementation of the system test plan for customer billing (CBSS) system including a wide variety of hardwares, softwares, and languages such as, ES/9000, MVS/ESA, CICS/DB2, ENDEAVOR INFORMAN, PDM, SPUFI, QMF, VSAM, JCL, and VS COBOL II. Requirements: B.S. in Electronic Communication Engineering, or will accept B.S. in Systems Analysis, Computer science or equivalent, and 2 yrs experience in the job offered or 2 yr. as a Systems Analyst, Software Engineer or equivalent. Hours & Salary: 40 hrs. per week, OT as needed, 8:30AM-5:00PM-M-F, $50,000/yr. Send resume to Department of Labor/Workforce Program, P.O. Box 10869, Tallahassee, Florida 32302, Att: E.H., RE: JOFL#1843352

SENIOR ORACLE DATABASE ADMINISTRATOR to administer Oracle databases on major operating systems such as HP-UX, Sun Solaris, IBM AIX, Windows NT and VMS; tune the System Global Area for dedicated and multi-threaded server configurations; write shell scripts for logical and physical backups; simulate crash scenarios and test recoverability of the system; develop data models using relational and object oriented design principles and map data models to Data Definition Language; integrate Oracle databases with software such as Oracle Financials, SAP, Apache web server, Oracle web server, Developer 2000 and PowerBuilder; analyze problems in Oracle's Transparent Network Substrate (SQL*Net); conduct database and system audits; configure Oracle for different business needs such as On Line Transaction Processing and Decision Support Systems and implement business logic using OCI, Pro*C and PL/SQL. Require: M.S in Engineering/Computer Science and four years experience in the job offered or as Database Administrator/Application Programmer Experience gained before or after obtaining M.S. will be accepted. 40% travel required to client sites within the United States. Salary $78,000 per year, 8 am to 5 pm, M-F Mail resume in duplicate to: Georgia Department of Labor, Job Order# GA 6272825, 2943 N. Druid Hills Rd., Atlanta, GA 30329 or the nearest Department of Labor Field Service Office

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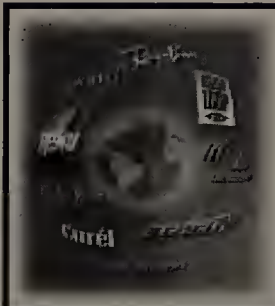

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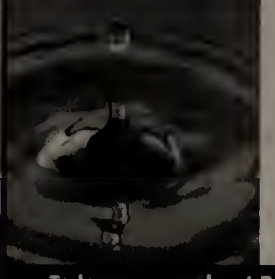

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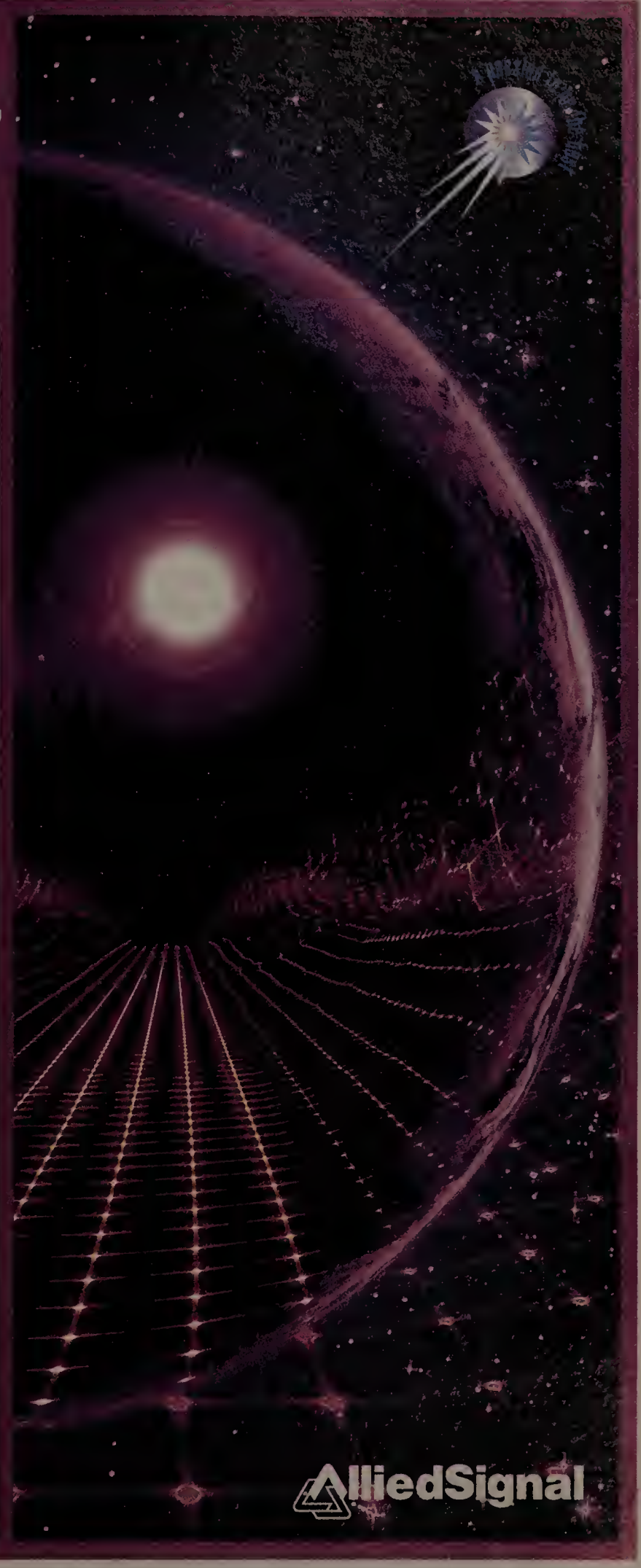

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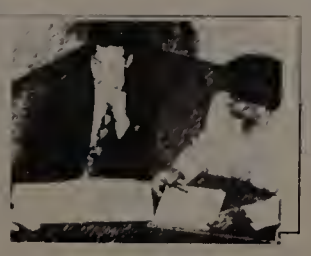

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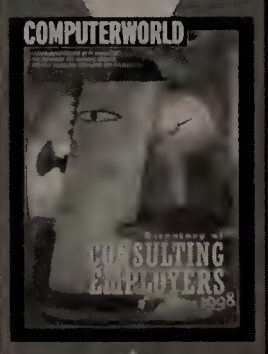

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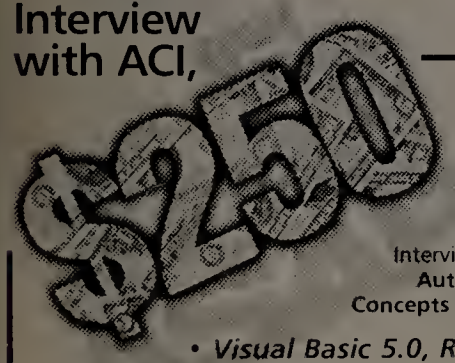

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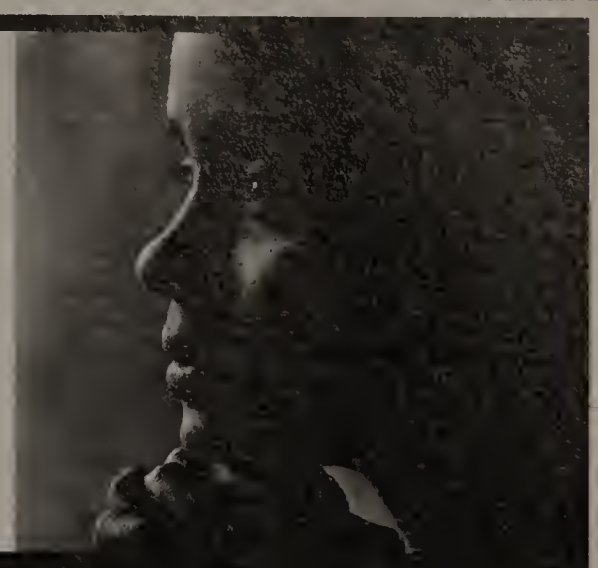

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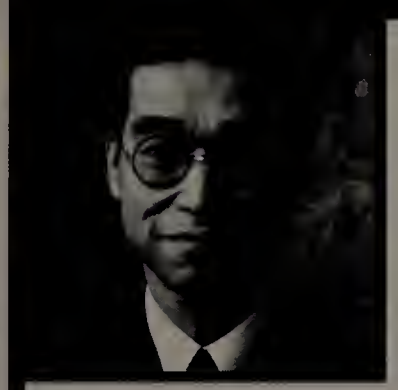

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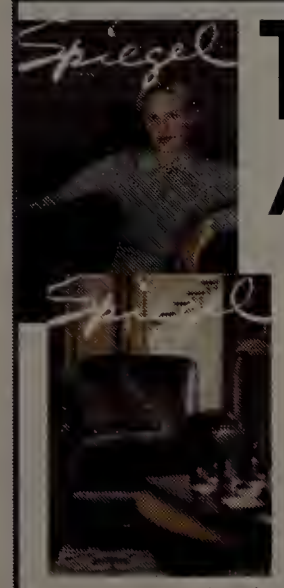

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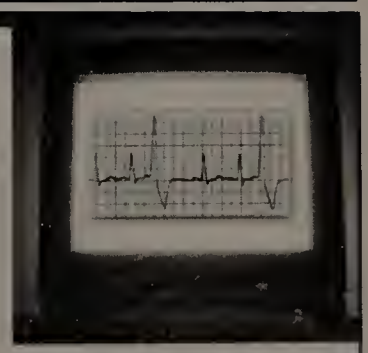

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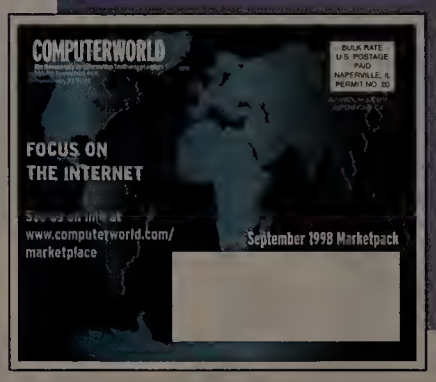

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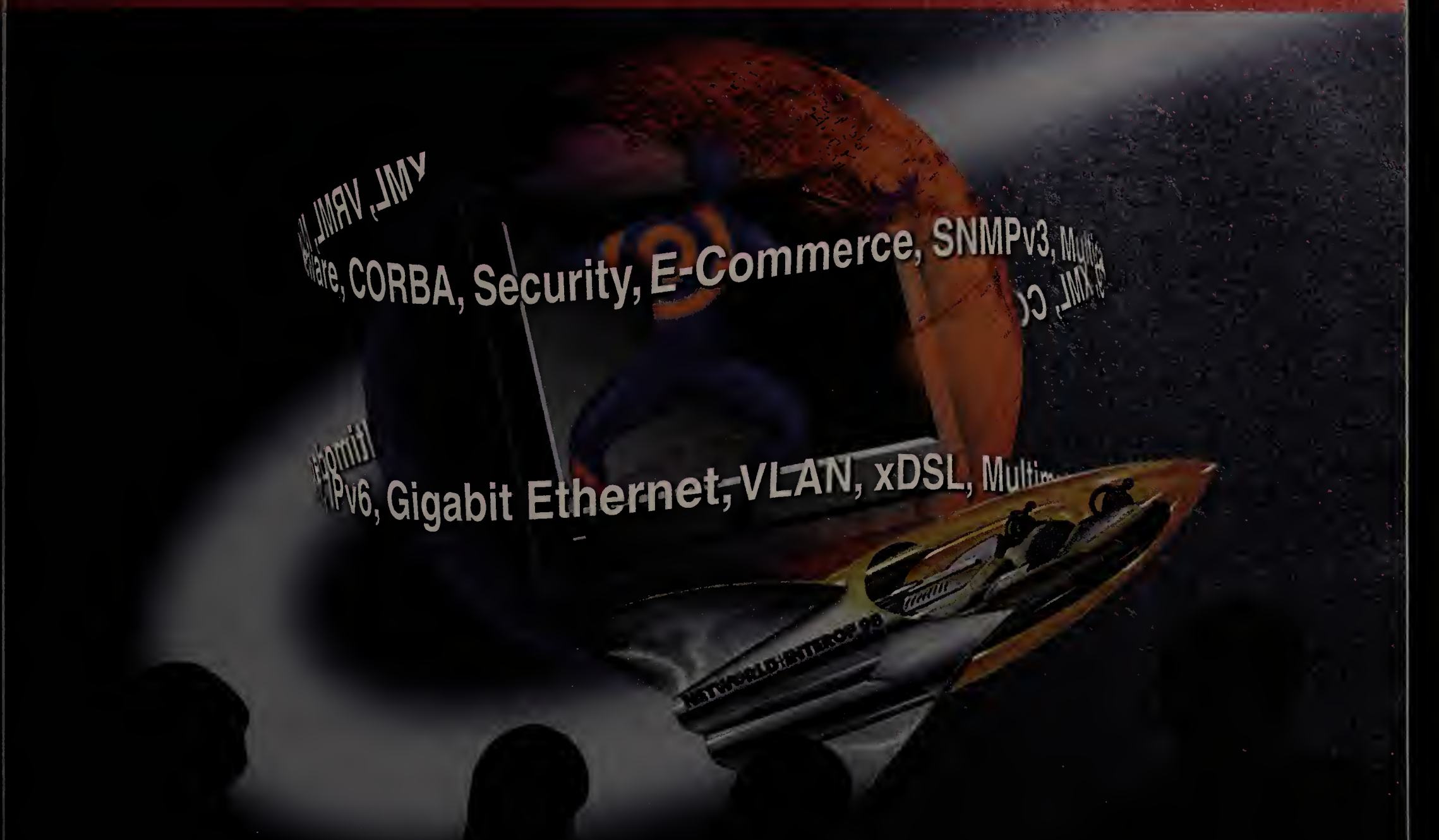

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ZD ZIFF DAVIS

The Week in Stocks

Gainers

PERCENT

Cypress Semiconductor Corp. (L)	17.9
Progress Software Corp.	14.5
Peoplesoft	13.3
Visio Corp. (L)	13.1
Data Race Inc.	11.8
Open Market Inc. (L)	7.7
Symantec Corp. (L)	7.7
Pegasus Systems	7.6

DOLLAR

Peoplesoft	3.81
Computer Sciences (H)	3.19
Visio Corp. (L)	3.13
Progress Software Corp.	2.75
J.D. Edwards Co.	2.13
Paychex	2.00
Documentum, Inc.	1.75
Auto Data Processing	1.69

Losers

PERCENT

Optical Data Systems Inc. (L)	-33.3
NetManage Inc. (L)	-32.0
MTI Technology Corp. (L)	-31.3
Evans and Sutherland (L)	-30.9
Intelligent Info. Systems (L)	-28.6
ObjectShare, Inc.	-28.0
VLSI Technology (L)	-26.5
Shiva Corp. (L)	-25.0

DOLLAR

Amazon.com	-23.38
America On-Line	-12.19
Dell Computer Corp.	-11.88
Yahoo! Inc.	-10.56
Microsoft Corp.	-8.88
Cambridge Tech. Partners (L)	-8.13
Sapient Corp.	-7.63
Motorola Inc. (L)	-7.00

INDUSTRY ALMANAC

Tech stocks still good bet

Last week's stock market volatility turned everyone into long-term investors. If that's the case, investors with a stake in technology companies have little to fear from the panicked sell-off triggered last Monday when Russia devalued the ruble, according to five analysts.

The tech-laden Nasdaq rose 75.84 points, or 5%, last Tuesday, after it lost a record 140.43 points — or 8.4% of its value — the previous day. The Dow Jones industrial average, meanwhile, ended Tuesday up 288.36 points, or 3.8%, after tumbling 512.61 points, or 6.4%, the day before. By Thursday, however, the Dow had dipped another 145 points.

Tech stocks are still good investments, says David Takata, an analyst at Grunthal & Co. in Beverly Hills, Calif. Takata, who's bullish on networking stocks, points to Cisco Systems, Inc. (Nasdaq: CSCO), which reported a 31% increase in net sales for the year ended July 25. Cisco stock lost $12.81 per share last Monday but had recoverd most of its value later in the week.

But Takata warns that lingering problems in Asia could slow growth among PC companies. Because PC buyers are increasingly price-sensitive, "the PC slowdown that we saw in the first half of the year is going to continue through the second half," he adds.

Tech stocks were hit particularly hard last week because they enjoyed the market boom earlier this year, says Ed Bierdeman, an analyst at Dakin Securities in San Francisco. "The higher-risk tech stocks lead market advances and they lead market declines," he says.

Mike McConnell, an analyst at Infonetics Research, Inc., says established companies such as IBM (NYSE: IBM), Microsoft Corp. (Nasdaq: MSFT) and Intel Corp. (Nasdaq: INTC) are relatively safe investments for the long haul, but he warned against Internet-based companies. "They are still overvalued," McConnell says. — Tom Diederich

ROLLER COASTER

High-technology stocks took a hit last Monday, but gained some back by midweek:

Company	Friday 8/28	Monday 8/31	Tuesday 9/1	Wednesday 9/2
Microsoft	105¼	95 15/16	101¼	100 9/16
Cisco Systems	94 11/16	81⅞	90	91⅝
Intel	77	71 3/16	76	74⅞
IBM	122 9/16	112⅝	117 15/16	120½
Compaq	30¾	27 15/16	29⅞	30⅛

Exch	52-Week	Range		Sept. 4 2 PM	Wk Net change	Wk Pct change
Communications and Network Services					**OFF -8.9%**	
COMS	56.75	22.94	3COM Corp.	24.25	-2.13	-8.1
AIT	52.13	30.13	AMERITECH Corp.	46.69	-2.06	-4.2
ASND	55.06	22.00	Ascend Communications	38.81	-1.13	-2.8
T	68.50	39.00	AT & T	53.75	-2.31	-4.1
BNYN	13.38	1.75	Banyan Systems Inc.	2.50	-0.25	-9.1
BEL	53.00	36.19	Bell Atlantic Corp.	42.25	-3.13	-6.9
BLS	73.63	43.31	Bellsouth Corp.	66.19	-1.75	-2.6
BRKT	22.75	9.50	Brooktrout Technology	11.75	-1.13	-8.7
CS	36.25	6.63	Cabletron Systems (L)	7.06	-0.88	-11.0
CGRM	21.88	8.13	Centigram Communications (L)	8.31	-1.44	-14.7
CSCO	105.25	45.50	Cisco Systems Inc.	89.38	-6.13	-6.4
CMNT	6.50	3.38	Computer Network Tech.	4.69	-0.25	-5.1
CNCX	41.00	7.88	Concentric Network Corp.	15.00	-3.00	-16.7
DIGI	35.69	16.50	DSC Communications	26.31	0.94	3.7
FORE	28.00	13.25	FORE Systems Inc.	16.50	-2.94	-15.1
GDC	7.44	2.50	General Datacomm Inds. (L)	2.63	-0.56	-17.6
GSX	47.25	35.56	General Signal Networks (L)	36.69	-1.19	-3.1
GTE	64.38	40.50	GTE Corp.	48.50	-3.56	-6.8
LU	108.50	36.19	Lucent Tech.	74.31	-6.50	-8.0
MADGF	9.19	2.63	Madge Networks NV	3.13	-0.06	-2.0
MCIC	70.63	27.31	MCI Communications Corp.	56.50	-1.06	-1.8
NETM	5.25	1.00	NetManage Inc. (L)	1.06	-0.50	-32.0
NTRX	3.50	0.63	Netrix Corp.	1.06	-0.06	-5.6
NCDI	13.75	5.50	Network Computing Devices (L)	6.75	-0.38	-5.3
NWK	20.63	9.75	Network Equipment Tech. (L)	10.38	-1.56	-13.1
NN	69.38	18.00	Newbridge Networks Corp. (L)	19.63	-1.38	-6.5
NT	69.25	39.69	Northern Telecom Ltd.	50.56	0.00	0.0
NOVL	13.63	6.81	Novell Inc.	10.09	-0.72	-6.6
ODSI	14.50	3.63	Optical Data Systems Inc. (L)	3.75	-1.88	-33.3
PCTL	13.50	5.38	Picturetel Corp. (L)	5.75	-1.25	-17.9
OPEN	3.50	0.97	Proteon Inc.	1.00	-0.06	-5.9
RACO	4.13	1.00	Racotek Inc.	2.00	0.13	6.7
RADS	29.38	5.75	Radiant Systems Inc (L)	6.13	-0.38	-5.8
VRTL	11.00	1.88	Retix	2.13	-0.25	-10.5
SBC	46.56	28.06	SBC Communications	37.63	-2.38	-5.9
SFA	27.94	14.00	Scientific Atlanta Inc.	18.88	-1.13	-5.6
SHVA	15.50	3.50	Shiva Corp. (L)	3.94	-1.31	-25.0
FON	75.63	45.25	Sprint Corp.	64.38	-6.88	-9.6
QWST	47.50	19.88	QWest Communications Int L Inc.	26.25	-3.56	-11.9
SMSC	18.13	6.25	Standard Microsystems Corp. (L)	6.94	-0.06	-0.9
USW	58.00	0.19	U S West Inc.	49.13	-3.31	-6.3
XIRC	27.25	8.63	Xircom	17.75	-4.00	-18.4
XYLN	31.31	13.38	Xylan Corp.	14.88	-2.25	-13.1
Note: Bay Networks stopped trading Aug 28.						
PCs and Workstations					**OFF -4.0%**	
AAPL	43.75	12.75	Apple Computer Inc.	35.13	-0.75	-2.1
CPQ	39.75	23.13	Compaq Computer Corp.	29.38	-1.50	-4.9
DELL	129.38	35.00	Dell Computer Corp.	107.63	-11.88	-9.9
GTW	68.75	25.06	Gateway 2000 Inc.	46.56	-6.25	-11.8
HWP	82.38	47.75	Hewlett Packard Co. (L)	50.13	-1.38	-2.7
MUEI	20.75	8.44	Micron International Inc.	13.88	-0.13	-0.9
NIPNY	63.88	35.50	NEC America (L)	35.50	-1.13	-3.1
SGI	30.31	9.06	Silicon Graphics (L)	10.19	0.00	0.0
SUNW	52.81	30.38	Sun Microsystems Inc.	42.06	-0.25	-0.6
Large Systems					**OFF -6.2%**	
DGN	36.06	7.00	Data General Corp. (L)	8.50	0.00	0.0
IBM	138.13	88.63	IBM	119.88	-3.38	-2.7
MDCD	6.63	1.69	Meridian Data Inc. (L)	1.88	-0.25	-11.8
NCR	38.50	25.13	NCR Corp (L)	25.38	-2.81	-10.0
PRCM	18.63	3.56	ProCom Technology, Inc. (L)	4.56	-0.56	-11.0
SQNT	31.25	5.75	Sequent Computer Sys. (L)	6.75	-0.75	-10.0
TEXM	6.00	2.50	Texas Micro Inc (L)	3.00	0.13	4.3
SRA	60.75	21.44	Stratus Computer Inc.	28.13	-0.81	-2.8
UIS	30.69	11.06	Unisys Corp.	19.00	-2.50	-11.6
Software					**OFF -6.1%**	
ADBE	53.13	24.06	Adobe Systems Inc.	24.38	-2.13	-8.0
AMSWA	15.63	2.63	American Software Inc. (L)	2.63	-0.63	-19.2
APLX	11.50	2.13	Applix Inc. (L)	2.28	-0.41	-15.1
ARDT	15.88	6.63	Ardent Software	11.13	-0.38	-3.3
ARSC	36.38	19.25	Aris Corp.	23.00	-1.50	-6.1
ADSK	51.13	22.25	Autodesk Inc.	22.94	-2.06	-8.3
BMCS	58.50	27.38	BMC Software Inc.	46.69	-1.69	-3.5
BOOL	26.00	17.13	Boole and Babbage	22.25	0.75	3.5
BOBJY	20.00	7.50	Business Objects	10.38	0.38	3.8
CAYN	3.50	0.13	Cayenne Software Inc. (L)	0.22	0.00	0.0
CNTR	3.31	0.88	Centura Software	1.25	-0.09	-7.0
CHKPF	50.50	17.13	Checkpoint Software Tech. Ltd. (L)	19.63	-0.25	-1.3
COGNF	34.75	16.63	Cognos Inc. (L)	18.56	0.50	2.8
CA	61.94	26.00	Computer Associates (L)	29.81	-0.88	-2.9
CPWR	60.31	26.75	Compuware Corp.	51.25	0.81	1.6
CSRE	9.81	2.50	Comshare Inc. (L)	3.88	0.00	0.0
COSFF	6.50	1.06	Corel Corp. (L)	1.22	-0.06	-4.9
DWTI	5.38	2.13	Dataware Technologies Inc.	2.63	-0.25	-8.7
DCTM	59.63	26.00	Documentum, Inc.	39.75	1.75	4.6
FILE	32.88	7.56	Filenet Corp.	16.13	-2.38	-12.8
FRTE	16.56	2.78	Forte Software (L)	3.00	-0.88	-22.6
GPSI	40.00	20.38	Great Plains Software, Inc.	35.25	-0.13	-0.4
HUMCF	54.25	18.25	Hummingbird Comm. Ltd. (L)	18.44	-1.81	-9.0
HYSL	53.25	25.13	Hyperion Solutions Corp.	25.63	-3.81	-13.0
IRIC	20.00	9.75	Information Resources (L)	11.13	0.06	0.6
IFMX	10.75	3.50	Informix Corp. (L)	4.03	-0.09	-2.3
INPR	12.19	5.13	Inprise Corp. (L)	5.25	-0.38	-6.7
INGR	14.19	5.50	Intergraph Corp. (L)	5.69	-0.88	-13.3
LEAF	4.00	0.75	Interleaf Inc. (L)	1.25	-0.06	-4.8
ISLI	21.25	10.63	Intersolv Inc. (L)	12.19	-1.31	-9.7
INTU	67.94	24.38	Intuit Inc.	39.06	-4.19	-9.7
JDEC	46.25	24.88	J.D. Edwards Co.	42.13	2.13	5.3
TLC	32.81	13.00	Learning Co. (The)	16.94	-2.44	-12.6
MANU	66.38	13.50	Manugistics Group, Inc.	13.63	-2.75	-16.8
MAPS	14.25	8.38	MapInfo Corp	10.63	0.13	1.2
MATH	4.63	1.75	MathSoft	2.16	0.13	6.2
MENT	13.00	6.75	Mentor Graphics (L)	7.53	0.23	3.9
MIFGY	60.63	25.13	Micro Focus (L)	25.25	-4 13	-14.0
MGXI	14.88	6.00	Micrografx Inc.	10.13	-0.75	-6.9
MSFT	119 63	59.00	Microsoft Corp.	97.81	-8.88	-8.3
OBJS	5.25	0.44	ObjectShare, Inc.	1.13	-0.44	-28.0
OMTL	15.00	2.19	Omtool Ltd	3.00	-0.44	-12.7
ORCL	40.06	17.75	Oracle Corp	20.25	-1 44	-6 6
PMTC	36.31	9.00	Parametric Technology (L)	9.94	-1.31	-11.7
PSFT	S7.44	26.88	Peoplesoft	32.44	3.81	13.3
PTEC	18.38	6.75	Phoenix Technologies (L)	7 25	-0.75	-9 4
PSQL	27.25	7.63	Platinum Software	13.19	-1.81	-12.1
PLAT	34.31	17.00	Platinum Technology (L)	18 44	-3.44	-15.7
PRGS	28.13	11.94	Progress Software Corp.	21.75	2.7S	14.S
RNBO	20.13	10.44	Rainbow Technologies Inc. (L)	11.88	-0.75	-5.9
REDB	11.00	1.88	Reo Brick Systems Inc.	2.13	-0.25	-10.5
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SAP	60.13	40 25	SAP AG (H)	47 94	0.50	1.1
SCOC	7.25	2.38	SCO Inc. (L)	2.7S	-0.44	-13.7
SDTI	42.75	9 38	Security Dynamics Tech (L)	10.44	-0.50	-4 6
SSW	32.81	16.25	Sterling Software Inc.	21.00	-0 50	2.3
SDRC	30.00	8 7S	Struct. Dynamics Research (L)	9 13	-1 69	-15 6
SYBS	23.63	5.56	Sybase Inc. (L)	6.2S	-0.69	-9 9
SYMC	32.63	16.38	Symantec Corp. (L)	19.25	1.38	7.7
SNPS	47.13	24.50	SynOpsys (L)	29.81	-0.06	-0.2
SSAX	16.75	3.44	System Software Assoc. (L)	3.91	-0.91	-18.8
SYSF	10.75	0.50	Systemsoft Corp. (L)	0.59	-0.09	-13.6
BAANF	55.50	28.38	The Baan Co. (L)	30.50	0.06	0.2
TRUV	5.19	0.75	Truevision Corp.	1.13	-0.13	-10.0
VIAS	58.25	6.25	Viasoft Inc. (L)	7.13	-0.88	-10.9
VSIO	50.88	19.00	Visio Corp. (L)	27.00	3.13	13.1
WALK	20.44	5.25	Walker Interactive Systems (L)	7.13	-0.38	-5.0
WALL	21.88	10.13	Wall Data Inc.	11.75	-2.25	-16.1
WANG	32.25	18.25	Wang Laboratories Inc. (L)	18.94	-1.94	-9 3
Note: FTP Software stopped trading Aug. 27.						
Internet					**OFF -9.2%**	
AMZN	147.00	13.88	Amazon.com	86.00	-23.38	-21.4
AOL	140.50	32.00	America On-Line	85.44	-12.19	-12.5
ATHM	57.25	18.00	At Home Corp.	30.50	-6.75	-18.1
EDFY	22.13	5.00	Edify Corp. (L)	5.38	-0.25	-4.4
XCIT	55.50	8.94	Excite, Inc.	25.25	-5.06	-16.7
SEEK	45.00	7.13	Infoseek Corp.	17.31	-4.7S	-21.5
LCOS	53.63	9.81	Lycos Inc.	24.81	-5.75	-18.8
NSCP	44.63	14.88	Netscape Comm. Corp.	21.31	-2.19	-9.3
NSOL	58.00	11.75	Network Solution Inc	28.38	-0.19	-0.7
OMKT	29.13	8.50	Open Market Inc. (L)	10.44	0.75	7.7
PEGS	31.00	12.50	Pegasus Systems	17.63	1.25	7.6
PSIX	21.94	4.25	PSINet	12.75	-2.00	-13.6
QDEK	3.40	0.25	Quarterdeck Corp. (L)	0.28	0.00	0.0
SCUR	15.25	5.56	Secure Computing Corp.	8.44	-0.06	-0.7
SPYG	15.38	4.06	Spyglass Inc.	11.63	-1.75	-13.1
YHOO	103.75	17.13	Yahoo! Inc.	74.38	-10.56	-12.4
Semiconductors					**OFF -6.1%**	
AMD	40.00	12.75	Advanced Micro Devices (L)	14.00	-1.19	-7.8
ADI	39.63	13.31	Analog Devices Inc. (L)	13.31	-1.81	-12.0
CRUS	17.75	6.00	Cirrus Logic (L)	6.69	-0.75	-10.1
CY	18.94	5.50	Cypress Semiconductor Corp. (L)	7.81	1.19	17.9
INTC	99.25	65.66	Intel Corp.	77.56	-0.06	-0.1
LSCC	74.50	24.00	Lattice Semiconductor	25.00	-0.56	-2.2
LSI	33.75	11.50	LSI Logic Corp. (L)	11.69	-1.19	-9.2
MCRL	46.88	21.38	Micrel Semiconductor Inc.	30.00	-2.50	-7.7
MU	45.69	20.06	Micron Technology	25.94	1.25	5.1
MOT	78.13	39.31	Motorola Inc. (L)	39.31	-7.00	-15.1
NSM	42.88	8.88	National Semiconductor (L)	9.38	-0.44	-4.5
RMBS	79.88	35.50	Rambus Inc	49.88	-5.13	-9.3
TXN	71.25	39.63	Texas Instruments	49.88	-2.44	-4.7
VLSI	38.69	7.25	VLSI Technology (L)	7.44	-2.69	-26.5
XLNX	55.63	28.50	Xilinx	31.75	-1.94	-5.8
Peripherals and Subsystems					**OFF -8.4%**	
ADPT	54.25	10.31	Adaptec Inc.	10.31	-0.81	-7.3
APCC	34.38	22.13	American Power Conversion	30.81	0.69	2.3
ANDA	2.81	0.50	Andataco Inc.	0.75	-0.06	-7.7
CREAF	29.38	8.88	Creative Technology Ltd. (L)	9.19	-0.88	-8.7
RACE	9.75	0.50	Data Race Inc.	1.78	0.19	11.8
DTM	13.69	7.88	Dataram Corp.	10.81	0.19	1.8
EMC	59.44	23.50	EMC Corp.	48.06	-3.13	-6.1
EMLX	19.75	5.31	Emulex Corp.	10.44	0.06	0.6
ESCC	35.88	14.69	Evans and Sutherland (L)	14.69	-6.56	-30.9
EXBT	12.75	5.13	Exabyte (L)	5.13	-1.13	-18.0
IISFD	4.50	0.63	Intelligent Info. Systems (L)	0.63	-0.25	-28.6
IOM	16.75	3.44	Iomega Corp. (L)	3.50	-0.S0	-12.S
KMAG	23.25	2.25	Komag Inc. (L)	2.69	-0.25	-8.5
MTSI	33.38	11.00	Micro Touch Systems Inc. (L)	11.44	-0.94	-7.6
MTIC	17.88	3.31	MTI Technology Corp. (L)	4.13	-1.88	-31.3
AQM	23.06	2.25	QMS Inc.	3.13	-0.25	-7.4
QNTM	43.25	10.81	Quantum Corp. (L)	13.28	-0.78	-5.6
RDUS	7.50	1.25	Radius Inc. (L)	1.31	-0.13	-8.7
SEG	40.63	16.13	Seagate Technology (L)	18.69	-1.88	-9.1
SOS	12.50	2.44	Storage Computer Corp.	2.88	-0.06	-2.1
STK	51.13	21.06	Storage Technology (L)	25.06	0.56	2.3
TEK	48.19	15.19	Tektronix Inc. (L)	16.13	-0.88	-5.1
WDC	50.88	8.00	Western Digital Corp. (L)	8.81	-1.06	-10.8
XRX	116.50	66.19	Xerox Corp.	90.88	-5.06	-5.3
Services					**OFF -4.8%**	
AMSY	34.50	17.63	American Mgmt. Systems	28.00	-0.94	-3.2
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KEA	60.94	24.00	Keane Inc.	44.50	-3.50	-7.3
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PMS	48.38	29.06	Policy Management Sys.	42.38	0.88	2.1
REY	24.00	12.63	Reynolds and Reynolds (L)	13.06	-0.31	-2.3
SAPE	62.00	23.88	Sapient Corp.	33.13	-7.63	-18.7
SCBI	14 75	6.38	SCB Computer Tech Inc. (L)	7.63	-0.75	-9 0
SEIC	80.50	28.50	SEI Corp.	65.25	-4.50	-6.5
SMS	86.50	50.50	Shared Medical Systems	54.13	-0 31	-0.6
SSPE	24.25	10.75	Software Spectrum Inc.	16.25	0.31	2.0
SDS	40.00	22.44	Sungard Data Systems	32.88	-0.44	-1.3
SYNT	39.88	5 69	Syntel, Inc.	15.50	-1.50	-8.8
VST	16.75	7.25	VanStar Corp. (L)	7.25	-1 19	-14 1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Companies in this issue

Page number refers to page on which story begins. Company names can also be searched at www.computerworld.com.

3Com Corp. 53
Abaco International Group.....53
Action Technologies, Inc. 41
ActionTec Electronics, Inc. 43
Active Software, Inc. 45
Alpha Online Communications, Inc...14
Alta Software, Inc. 6
American Express Bank.....97
American Management Systems, Inc...1
American National Standards Institute.....17
Amoco Corp. 6
AMR Corp. 1
AMR Research, Inc. 4
Apple Computer, Inc. 8, 53, 96
Apria Healthcare Group 1
ARC Consulting.....33
Armstrong World Industries, Inc. 96
Arthur D. Little, Inc. 1
AT&T Corp.....29, 98
AutoConnect 16
Automotive Industry Action Group.....4
Axent Technologies, Inc.....62
Bay Networks, Inc. 33
Beach Communications Group, Inc. ..14
Bender Consulting Services, Inc. 68
BMC Software, Inc. 14
BP Oil International.....53
Buck Consultants 20
Burlington Northern Santa Fe Railway 6
Cable & Wireless Communications PLC.....12
Cabletron Systems, Inc. 41
Caldera, Inc.....8
Canadian Imperial Bank of Commerce.....33
Capital Reflections, Inc.....33
CBT Systems, Inc.....33
CCBN 37
Charlotte Pipe and Foundry Co. 41
Chrysler Capital Corp. 56
Cisco Systems, Inc.....41, 94
Citadel Technology, Inc. 43
Citicorp 1, 6
Citrix Systems, Inc. 16
Coalition Against Unsolicited Commercial Email 14
CommerceNet.....37
Compaq Computer Corp. 1, 96, 98
Compass America, Inc. 1
International, Inc. 12
Concorde Solutions, Inc.....45
Constellar Corp.....45
Conway Regional Medical Center.....56
Corporate Software & Technology, Inc. 33
Coudert Brothers 8
Critical Path, Inc. 41
CSC Consulting 4
D-Link Systems, Inc. 43
Daiwa Securities Company Limited America 45
Dakin Securities 94
Data General Corp.....1
Dell Computer Corp. 1, 96
Deloitte & Touche.....20, 62
Delta Air Lines, Inc. 29
Department of Defense.....17, 97
Department of Justice.....29
Digital Link Corp. 97
Dollar Bank 20
Dragon Systems, Inc. 68
Dunlop Tire Corp.....10
Duquesne Light Co. 68
DWS 16
Eastern Enterprises 37
Edify Corp.....37
Eli Lilly and Co. 20
Entrust Technologies, Inc. 17
Envive Corp.....41
Ernst & Young LLP.....62
Excalibur Technologies 53
Exchange Applications, Inc. 8
Farmland Industries, Inc. 14
Federal Computer Week.....62
Federal Express Corp.....14
Federal Reserve Bank.....97
Federal-Mogul Corp. 20
Financial Accounting Standards Board.....8
Finjan, Inc. 41
First National Bank 56
First Union Corp. 1, 20
Fiserve Solutions, Inc. 33
Fleet Financial Group 1
Flicks Software.....40
Ford Motor Co. 1, 4, 16
Fujitsu PC Corp.....53
GE Medical Systems.....33
General Electric Co. 33, 37
GigaNet, Inc.....1
Gitksan Government Commission 37
GMAC Commercial Mortgage Co. .1, 20
Goldis-Pittsburg Institutional Services 14
Gordon & Glickson PC 8
Great Plains Software.....1
Grunthal & Co.....94
Hemera Technologies, Inc.....40
Hewlett-Packard Co. 1, 4, 14, 33, 37
Holiday Inns 98
HTE, Inc. 33
Hylsamex 41
IBM ..1, 12, 20, 33, 37, 45, 53, 94, 96, 98
Inacom Corp.....6
Infonetics Research, Inc. 94
Information Management Forum 6
Information Security Advisers Group 62
InfoVista Corp.....43
Inprise Corp.....45, 97
Intel Corp.....1, 8, 94
Interliant, Inc. 41
International Data Corp.....1, 10, 41
Intria Corp.....33
Intria Items, Inc. 33
Intuit, Inc. 8, 12
J&H/KVI.....8
J. D. Power & Associates, Inc.....16
Japanese Auto Manufacturers Association 4
John Maneely Co. 56
Kundert Volvo 16
Legato Systems, Inc.....53
Lion America Corp. 29
Lotus Development Corp. 16, 41
Lucent Technologies, Inc. ..12, 14, 25, 33
Luminate Software Corp. 41
Lycos, Inc.....16, 29
Manpower, Inc. 33
MarketWave Corp. 37
Merrill Lynch & Co. 45
Michael G. Kessler & Associates Ltd...6
Microsoft Corp. ...1, 8, 12, 16, 17, 40, 41, ...45, 53, 94, 97, 98
Mobile Insights, Inc. 53, 96
Mutual Insurance Co. of Arizona.....96
Nathan-Lewis Securities, Inc. 41
National Board of Medical Examiners.....16
National Council on Disability 68
National Institute of Standards and Technology.....17
National Investor Relations Institute .37
National Organization on Disability ..68
National Science Foundation 12, 68
National Security Agency 17
National Success Marketing, Inc.....14
NationsBank Corp.....6, 45
NetGuard, Inc. 62
Netscape Communications Corp. 8, 17, 29
Network Solutions, Inc. 41
Nielsen Media Research 37
North Arundel Hospital 10
Novell, Inc. 16
Object Management Group.....45
Odette.....4
Office of Management and Budget....12
Olicom, Inc. 43
OneWorld Systems, Inc. 43
OptiSystems, Inc. 41
Optum, Inc.....33, 45
Oracle Corp.....1, 10, 33, 37, 45, 53, 97
Pacific Gas & Electric Co. 6
PC Docs Canada 33
PeopleSoft, Inc. 1, 41
Personal Creations 20
Pfizer, Inc. 1
PHH Vehicle Management Services, Inc.....16
Philips Technologies.....56
Pinpoint Software Corp. 20
Placer County (Calif.) Water Agency ...33
President's Choice Financial 33
Procter & Gamble Co.....4
Prototyping & Development Heuristics, Inc.....97
RCG Information Technology 6
RealNetworks, Inc. 8
Reel.com, Inc. 12
Renaissance Worldwide, Inc.....17, 41
Roberts Express Corp. 6
RTS Software.....33
SAP AG 12, 14, 29, 33, 41
Scriptics Corp. 45
Seagate Technology, Inc. 53
SEARCH Group, Inc. 65
Sebastian International 1
Secure Computing Corp. 62
Security Design International, Inc. 62
Seibel, Inc.....1
Sherwood Foods.....56
SmithKline Beecham Corp. 45
Smithsonian Institution.....98
Snow, Christensen and Martineau 8
Software Forum.....97
Sony 29
Spearman Cattle Feeders, Inc. 53
SRA International, Inc. 41
Staples, Inc. 37
StockMaster.....37
Storage Technology Corp.....53
Sullivan & Cogliano 6
Summit Strategies, Inc. 33
Sun Microsystems, Inc. 45
Sunset Direct, Inc. 40
Sybase, Inc. 53
Symbol Technologies, Inc. 53
Synergistics, Inc. 41
Tangram Enterprise Solutions, Inc.....20
Taylor Steel, Inc. 4
Technology Business Research, Inc. 4
TeleChoice, Inc. 25
Telysis Communications, Inc. 14
The Arbitron Co.....6
The Baan Co. 20, 41
The Boeing Co. 37
The British Petroleum Co. PLC 53
The Dow Chemical Co.....37
The Green Pages 56
Tivoli Systems, Inc. 14
Transquest.....33
Travelers Group, Inc. 1
Tri-Strata Security, Inc. 12
Trilogy Development Group, Inc.....40
United Food and Commercial Workers International Union 16
United Parcel Service of America, Inc. 14
Unum Corp.....68
Usability Sciences Corp.....41
USinternetworking, Inc. 1
Veritas Software Corp. 53
Viasoft, Inc. 20
VideoSoft 40
Vignette Corp.....45
Volvo Cars of North America, Inc.....16
W. Quinn Associates, Inc. 49
Walsh-Lowe Constantine Group LLC..25
Wang Laboratories 98
Westcoast Energy, Inc.....33
Weyerhaeuser Co. 14
Wilkinsburg-Penn (Pa.) Joint Water Board Authority.....33
Winchester Hospital 6
Workgroup Strategic Services, Inc.....1
Yahoo, Inc.....16, 29
Yamaha Corp. of America 10

ADVERTISERS INDEX

ASPECT 9
http://www.aspect.com
Baan International 59*
http://www.baan.com
Cap Gemini 40
http://www.capgemini.com
Computer Associates 22-23
http://www.cai.com
Corel C4
http://www.corel.com
Dell 26-27
http://www.dell.com
Gateway 2000 34-35
http://www.gateway.com
Harbinger 39
http://www.harbinger.com/
Hewlett-Packard 18-19, 52
http://www.hp.com
IBM C3
http://www.ibm.com
Information Builders 11
http://www.ibi.com
InterSystems Corp 44
http://www.intersys.com
JD Edwards 17
http://www.jdedwards.com
Lotus Development Corp. C2
http://www.lotus.com
(800) 343-5414
Mecklermedia 10
http://www.mecklermedia.com
Microsoft 50-51
http://www.microsoft.com
Netscape 15
http://www.netscape.com
New Horizons 30-31
http://www.newhorizons.com
Oracle Corp. 7
http://www.oracle.com
Platinum Technology 55
http://www.platinum.com
SAS Institute 13, 47
http://www.sas.com
Syncsort 5
http://www.syncsart.com
Tiffany 66
Trend Micro, Inc 21
http://www.trendmicro.com
Unisys 48, 49
http://www.unisys.com
(800) 874-8647 X100

*Regional Select Edition

New Compaq laptops have corporate spin

By Matt Hamblen

COMPAQ COMPUTER CORP. this week will announce two new Armada notebook computers and three enhanced models to offer a wider variety of processor speeds, prices and features to corporate customers.

The news follows Apple Computer, Inc.'s announcement last week of PowerBook G3, which is priced at $2,799 and comes with an active-matrix 14-in. display and a 233-MHz processor. Analysts said the Macintosh notebook will be especially important to consumers and students, as well as to artists and creative services staffers.

Compaq's news is important because the computer maker hasn't been viewed by users or analysts as a leader in the business notebook market.

"These announcements are the first time in a couple of years that Compaq has gotten [its] product act together," said Gerry Purdy, an analyst at Mobile Insights, Inc. in Mountain View, Calif. "Compaq is now looking at having a solid product offering in each of the target markets that enterprises would buy," he said.

That will help bring Compaq into competition with leaders such as IBM, Purdy and other analysts said.

One of the new Compaq models, the Armada 3500, uses the light-and-thin concept, which Compaq officials said is important to some corporate customers. At 4.4 pounds and 1.3 inches thick, it will include a 300-MHz Pentium II processor and a 13-in. active-matrix screen for $4,299. But to get a CD-ROM drive and floppy drive, the 3500 must be attached to an optional Mobile Expansion Unit that costs $299 and weighs 2.2 pounds.

"A big theme of these announcements from Compaq is that one size does not fit all," said Chet Pribonic, vice president of Compaq's portable PC division.

One corporate notebook customer said it makes sense for Compaq to offer a range of products, including the lighter one. "At the executive level, the No. 1 thing of importance to us is having a machine that's lightweight," said James A. Wellendorf, general manager of information systems at Armstrong World Industries, Inc. in Lancaster, Pa.

For light machines, Armstrong uses IBM 560s but has standardized on the Compaq Armada 7700 for its salespeople, who worry less about weight and want more processing power to run sales automation tools, Wellendorf said.

But "our executives said no way in hell would they cart around the Armadas" because they are 3 or 4 pounds heavier, he said.

Janet Wilson, IS manager at Mutual Insurance Company of Arizona, said the Phoenix firm is replacing older Compaqs with Dell Computer Corp. 233-MHz notebooks to take advantage of price and performance.

Apple notebooks and the Macintosh platform weren't a consideration for Wilson because they seem to be used almost exclusively by "the graphics crowd, and that just isn't our business," she said. □

COMPAQ'S LATEST ARMADA NOTEBOOK RELEASES

Model	Features	Price
3500 (new)	Pentium II 300, 13-in. screen	$4,299
6500 (new)	Pentium II 300, 14-in. screen	$4,999
1700 (revamp)	Pentium II 300, 14-in. screen	$3,799
7400 (revamp)	Pentium II 300, 13-in. screen	$3,999
7800 (revamp)	Pentium II 300, 14-in. screen	$5,399

Armada 6500

Clustering demos

CONTINUED FROM PAGE 1

with 3.3T bytes of Fibre Channel-attached storage from Data General Corp.'s Clariion storage division, will use interconnect technology from GigaNet, Inc.

Dell itself acknowledges that there are gaps that remain to be plugged — especially in terms of cluster management software — before the technology can be widely adopted.

Clusters based on standard Intel PC components are expected to be cheaper than proprietary RISC hardware.

Clustering technology has been available for years in the Unix space. It lets users link multiple servers to increase server reliability and scalability. Both are crucial for hosting large, fast-growing applications such as data warehousing and enterprise resource planning.

Joseph Pollizzi, a longtime user of Unix server clusters, said he is underwhelmed by the Dell and Compaq demonstrations because he thinks Windows NT isn't ready to take on high-end applications.

But similar cluster configurations based on Intel's forthcoming 64-bit Merced chips running Unix could be attractive, said Pollizzi, deputy head of science and engineering at the Space Telescope Science Institute in Baltimore. "We certainly expect to see more sophisticated clustering technologies once Merced starts shipping. . . . The anticipation is that it would be cheaper," he said.

Reza Rooholamini, a development manager at Dell, said the demonstration shows that configurations like this can be put together using industry-standard components.

In a similar but less ambitious demo, Compaq Computer Corp. last week showed off a seven-way, parallel cluster of off-the-shelf, quad-processor Pentium Pro-based workstations at the Seybold San Francisco/Publishing '98 conference.

Drug maker Pfizer, Inc. uses the cluster to convert tens of thousands of scanned images of Food and Drug Administration research filings into searchable online documents.

"There is no doubt that people are going to need these kind of features" as they begin running large applications on Intel servers, said Amir Ahari, an analyst at International Data Corp. in Framingham, Mass., a sister company to *Computerworld*.

Clustering's adoption in the Wintel space has been limited to basic two-node, high-availability configurations mainly because the software to take advantage of scalable clustering isn't available yet. Microsoft Corp.'s Cluster Server software — which is regarded as the industry standard — today supports only fail-over clustering, although the company is working on a version that will support eight nodes.

This week's Dell demonstration deals more with the underlying clustering hardware. The 16 Dell servers in the cluster are based on Intel's new 400-MHz Xeon chip. Each server uses a network card from GigaNet that is connected via six GigaNet switches, and each will run a copy of NT and IBM's DB2 Universal Database.

DB2 uses the cluster network to send and receive data between the servers with the cluster. The 2 billion-record database itself is stored on Clariion external Fibre Channel disk arrays. □

Twin efforts push performance

CONTINUED FROM PAGE 1

ing as early as this fall — are aimed at bolstering scalability, availability and reliability of IBM's Intel-based NT servers.

IBM's efforts with Compaq and HP could wrest control of a crucial bit of server technology from Intel. The trio have created a new bus design said to double the rate at which information can be exchanged between a computer's microprocessor and I/O devices such as a printer or hard disk drive.

The technology currently in use is an Intel-led standard called Peripheral Component Interconnect (PCI), which operates at 66 MHz. The proposed PCI-X technology from the three PC makers will operate at 133 MHz.

Lending urgency to the efforts by the three vendors are fears that Intel would start charging royalties for its own successor to PCI now under construction.

"From an industry standpoint, this is fundamentally a good thing even if there is a dispute. . . . It means there is some progress on higher performance for servers," said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz. "The fact is that PCI doesn't cut it any longer."

HP and Compaq declined to comment.

A spokesman for Intel said it can't comment until it has fully reviewed the proposal. A spokesman for Dell Computer Corp. said that company is committed to following industry standards and would consider the new technology if it is approved by the PCI group.

THE NETFINITY FRONT

With NetFinity, IBM is bringing its decades of experience in the glass house to bear on its Windows NT server.

The idea is to give users the functionality required to run large applications safely on NT platforms, said Amir Ahari, an analyst at International Data Corp. (IDC) in Framingham, Mass. IDC is a sister company to *Computerworld*.

Highlights of the road map, which IBM will unveil at this week's Business Applications Conference, hosted by Microsoft Corp. in Las Vegas, include the following:

- An ESCON channel adapter due this fall that will give companies a direct high-speed link between data on S/390 mainframes and NetFinity networks.
- Switching technology from IBM's highest-end RS/6000 SP multiprocessing Unix server due early next year that will let companies build large Intel-based NT clusters.
- Cluster-management software due next year that will let users tie together NT and RS/6000 clusters and give users a single point of control.

Such capabilities are going to be crucial at a time when several companies are considering migrating key corporate applications to Windows NT servers but are concerned about the scalability and reliability of the platform, according to John Dunkle, an analyst at Workgroup Strategic Services in Hampton, N.H. □

Developers defend Visual Studio 6.0

▸ *Microsoft allies say it's fine in Web context*

By David Orenstein
SANTA CLARA, CALIF.

BESIEGED BY competitors and critics of Microsoft Corp., Windows programmers at the Developer Days conference here last week insisted not only that the new development suite Visual Studio 6.0 is a rich Web-development environment, but also that it works well with non-Microsoft products.

A few developers even said the suite has strengthened their desire to leave behind Unix for Windows. The developers' resolve overcame the efforts of an aggressive squadron of Oracle Corp. employees who encircled the conference center, passing out literature that accused Visual Studio of being proprietary and ill-suited for World Wide Web development.

Many users disagreed. "Microsoft is the only show in town as far as I'm concerned," said Graham Churchley, a Mountain View, Calif.-based principal engineer at Infinity, which makes enterprise software for trading and risk management for banks like American Express Bank.

Banks run Infinity software on either Unix or NT. Although in most enterprises, the bottom tier that hosts the data will likely remain Unix-based, the use of Microsoft's Component Object Model has let Infinity recently develop for Windows clients on the top tier. With Windows on their desktops, Churchley said, traders can use a familiar Excel front end.

Susan Luna, information technology development manager at Digital Link Corp. in Sunnyvale, Calif., said the company used to base its Web site on Unix, using C and Perl. But the networking equipment company wanted access to a broader set of development tools, so it migrated to a Windows environment when it developed its online order-tracking and systems-configuration software.

Microsoft's Java tool Visual J++ also is sufficiently improved in Visual Studio 6.0 to replace Inprise Corp.'s JBuilder Java Tool at the Federal Reserve Bank in San Francisco, said Thermond Adams, an applications programmer/analyst in the bank's Web development group.

J++ 6.0 has improved testing and debugging tools, he said, and the user-interface creation tools are a major leap from Visual J++ 1.1, which was "a piece of junk."

Microsoft focused on two major areas in its Visual Basic, C++, J++, FoxPro and Interdev tools: better Web integration and broader data access, including the ability to join tables from Microsoft's SQL Server and Access with tables from Oracle8 as if they were tables from the same database.

That feature impressed Marlon Baldovino, a technical staff member at San Jose, Calif.-based Prototyping & Development Heuristics, Inc., which is developing a financial contract-writing application for the Department of Defense. The application will need to incorporate disparate data sources.

Allan Colby, a Visual Basic developer and vice president at the Silicon Valley area users group Software Forum, said a new Visual Studio feature — Web classes — will let him program product demos on Web sites as easily as he does in PC-based executables now.

Larry Perlstein, an analyst at Dataquest in San Jose, agreed with developers that Visual Studio's viability for distributed corporate computing is improving but cautioned that Visual Studio "still has a way to go to be classified as an enterprise tool." He said the product needs greater scalability, better interoperability and better tools to manage deployed applications. □

Calling all Office developers

Microsoft within a month will begin beta-testing its Office 2000 Developer Edition, which lets programmers create custom applications based on Word, Excel, PowerPoint and Access.

The edition, which will be released with Office 2000 in the first half of next year, will let developers create Component Object Model add-ins that can be integrated into any Office application. Other features include Visual SourceSafe version management and a repository for code snippets.

Microsoft officials claim that there are 2.6 million Office developers. — David Orenstein

ERP rentals lure users

CONTINUED FROM PAGE 1

licenses up front. Instead, they would pay a flat monthly fee for Internet access to applications housed and maintained off-site on vendor-owned computers.

The rental programs, which are being targeted at midmarket companies, are supposed to eliminate long, complex implementations and cut high software maintenance costs. Though estimates are hard to come by, the rental approach is expected to at least make costs more predictable and guarantee service levels. It would also reduce companies' need for costly and hard-to-retain in-house IT talent.

So what's not to like?

"In a nutshell, it's a brilliant idea. But it's way ahead of its time," said Bruce Richardson, an analyst at AMR Corp. in Boston.

"Conceptually, users love the idea because they'd get a flat monthly bill. But there are a lot of issues that have to be worked out. Vendor lock-in is one. Another is what to do with your existing IT staff," Richardson said.

Still, vendors are forging ahead with the services, banking that users of enterprise resource planning (ERP) software will jump on the leasing plans as quickly as they have embraced other ERP outsourcing options.

And Forrester Research, Inc. in Cambridge, Mass., is projecting that the market for application rentals — which stands at zero today — will reach $6.4 billion by 2001.

"We really didn't have the expertise. We went live in January, and in April, we still had unacceptable performance."

– Dianne King, Sebastian International

Last week, Great Plains Software and IBM Global Services jointly announced a service under which IBM will host and maintain users' Great Plains financial software for $300 to $450 per user per month.

"The idea is we provide the hardware and software all bundled together, so users don't have to worry about buying anything. They're literally plugging in to a service," said Kathy Dodsworth-Rugani, director of IBM's electronic-business services.

And though the service is targeted at companies with annual revenue of less than $1 billion, much larger companies are showing great interest, she said. "Large multinationals in particular are interested because this lets them set up services and support in other countries," Dodsworth-Rugani said.

USinternetworking, Inc. in Annapolis, Md., also will launch an applications service next month. It gives users access to PeopleSoft, Inc.'s financial and human resources applications and Seibel, Inc.'s sales force software for a flat monthly fee. Users pay nothing up front for software licenses and need only an Internet browser to access applications.

Oracle Corp. also has announced plans to lease its software over the 'net by year's end.

THE NEXT PHASE

Analysts characterized the rental programs as an inevitable phase in the ongoing evolution of ERP outsourcing services, which, they added, were bound to take advantage of the Internet eventually.

They said users also are bound to embrace the programs, just as they have latched on to more traditional applications outsourcing services, which amounted to more than $2 billion this year, according to Forrester.

Last week, Mitsubishi Consumer Electronics, Inc. signed a three-year outsourcing deal with Origin, a Dutch company, to take over day-to-day operations of its SAP R/3 system.

Another company to outsource is Sebastian International in Woodland Hills, Calif. The hair care products company outsourced management of its SAP AG R/3 enterprise software to Waltham, Mass.-based Plaut Consulting, Inc. three months after going live with the system.

"We really didn't have the expertise," said Dianne King, IT director. "We went live in January, and in April, we still had unacceptable performance."

At one point, King said, it was taking between two and three hours to calculate delivery dates for five warehouses. "We were losing customers because we weren't delivering in the promised time," she said. Now, the same program takes Plaut between two and three minutes to run, King said.

Another ERP outsourcing convert is Simpson Industries, Inc., a $450 million auto parts manufacturer in Troy, Mich. Simpson's nine U.S. locations plus a plant in Mexico all run on J. D. Edwards & Co. software, which is physically housed in Rochester, N.Y., on a mainframe operated by IBM Global Services. □

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NEWS

The Back Page

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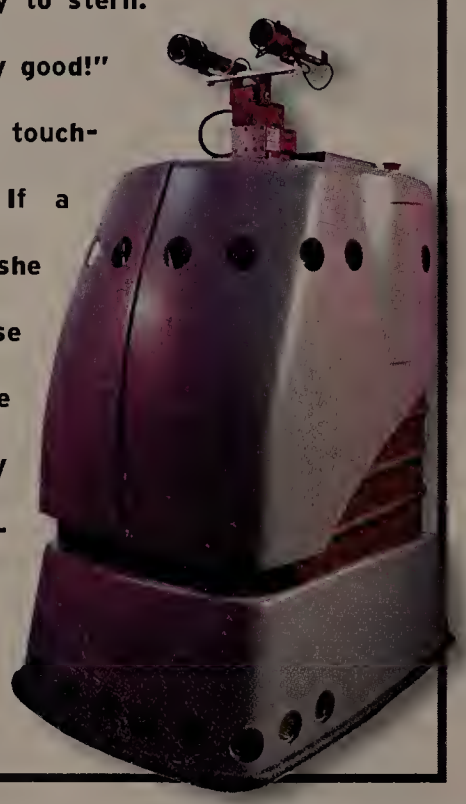
Dispatches & images from the fringes of the electronic frontier

MINERVA: ROBOT TOUR GUIDE

For the first time in Smithsonian Institution history, a robot gave a tour in the Washington museum. Minerva's pleasant voice described the "Material World" exhibit, while computers, sensors and laser range-finders helped her navigate and avoid collisions. Her commentary ranges from perky to stern. "Oooh, that feels really good!" she coos when someone touches her touchscreen. If a crowd blocks her path, she asks, "Could you please make some space?" The robot was developed by Carnegie Mellon University in Pittsburgh and the University of Bonn in Germany.



Digital archives

10 YEARS AGO

(September 1988)

■Battle of the bus: The "Gang of Nine" PC clone vendors, led by Compaq, offers the Extended Industry Standard Architecture (EISA) as an alternative to IBM's Micro Channel bus.

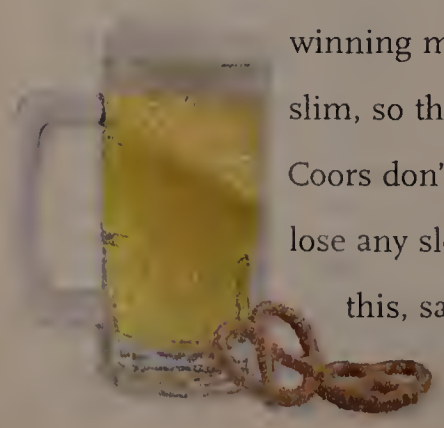
5 YEARS AGO

(September 1993)

■Microsoft outlines plans for a "Plug and Play" hardware and software scheme that would enable PCs to configure themselves when new devices are added.

■Wang Laboratories emerges from Chapter 11 bankruptcy protection with a narrow focus on selling document-imaging and workflow software.

Internet surfing has displaced beer drinking as the No.1 pastime on college campuses, according to a Spring 1998 study of college students by Student Monitor LLC in Ridgewood, N.J. But the 'net's winning margin was slim, so the folks at Coors don't need to lose any sleep over this, says analyst Eric Weil.



THE FIFTH WAVE *by Rich Tennant*

E-Mail Rich Tennant at the5wave@tiac.net

"I've been in hardware all of my life, and all of a sudden, it's software that'll make me rich."

Inside Lines

Top story: No more politicians?

Last Friday in Dublin, President Clinton and Irish Taoiseach (Prime Minister) Bertie Ahern digitally signed a communique calling for global cooperation in promoting electronic commerce. The "signing" — which actually consisted of the two leaders inserting smart cards into separate computers — marked the first time digital signatures were used to sign an intergovernmental document. But Clinton joked he was "somewhat ambivalent" about the electronic approach. "I'm going to feel utterly useless if I can't [sign my name] anymore," he said. "You may find you can get away with virtual presidents, virtual prime ministers, virtual everything — just stick a little card in and get the predictable response."

Is this any way to run a railroad?

Subways ran only sporadically in San Francisco last week as an automated traffic-management system for the San Francisco Municipal Railway (Muni) came online — and brought the city-owned system to a screeching halt. The new system, designed by France's Alcatel Transport Automation, repeatedly shut down, stranding throngs of commuters — until someone noticed that 20 of Muni's 116 trains had never been equipped with the necessary hardware to link up with the new system. Those 20 trains didn't get the upgrade because they already were slated for retirement due to being so breakdown-prone — and each time one broke down, the new automation shut down the entire subway system. The troublesome trains have been pulled.

Hey, I thought SAP did capacity planning . . .

SAP America had some, er, scalability problems at its TechEd '98 developers conference in Los Angeles last week. Many of the meeting rooms were far too small, resulting in standing-room-only sessions — and some got so full that R/3 programmers and systems administrators spilled out into the hallways of the Los Angeles convention center. Maybe the toughest ticket in town was a session on Java: TechEd workers turned away almost as many people as could be squeezed in and finally ended up closing the doors to discourage latecomers from hanging around outside.

No free trip, just a wild ride

OK, one last time: Despite the claims in that widely circulated spam letter from "Walt Disney Jr.," Microsoft and the Walt Disney Co. are *not* collaborating on E-mail tracking software. There are no $5,000 prizes or free trips to Disney World for those who respond. There's not even a Walt Disney Jr. (Walt had two daughters, no sons). But there is a Pamela Torres, a senior associate in Dell Computer's accounts payable division, whose name, E-mail address and phone number were forged to the comment, "We called Walt Disney from here in A/P, and it is true!!!!!!!!!!" A week after the hoax hit, Torres was still wading through electronic debris: 42 E-mail messages, 39 phone calls and eight faxes.

What the Internet was made for

Now comes a site that promises "the two most sought-after commodities on the Web" — financial data and sex. In an announcement tastefully headlined "Stocks 'n' Broads," Internet Entertainment Group of Seattle touted a new venture that will combine stock market data with graphic images that aren't referring to Dow Jones industrials. Network managers may want to add this to their Internet filtering/blocking software: ***www.sexquotes.com.***

A new poll from Yankelovich Partners says we're a society of message hounds — even when we're supposed to be relaxing. Of 810 Americans surveyed, 34% said while on vacation they checked their answering machine or voice mail at work, 41% used their cell phone to call work and 32% checked E-mail. According to the pollsters, users find the lack of electronic communications even more stress-inducing than getting all that spam. News editor Patricia Keefe gets jittery just thinking about life without your news tips and tidbits. E-mail her at patricia_keefe@cw.com or call (508) 820-8183.

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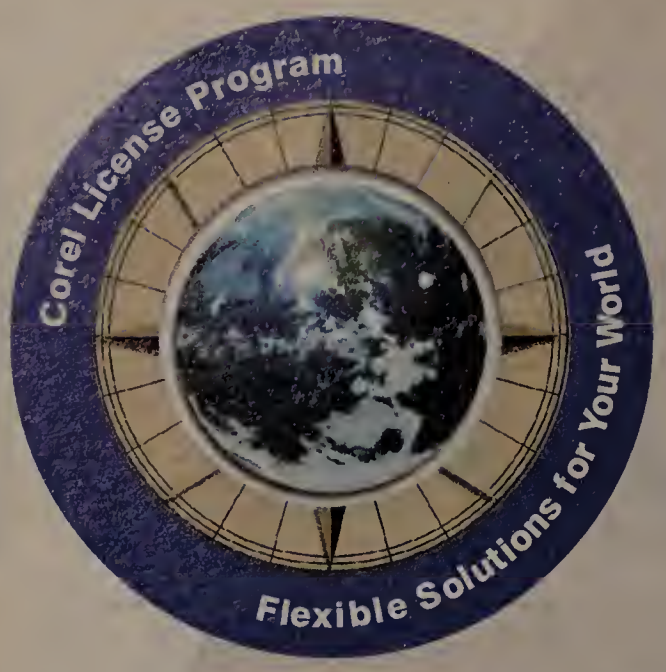

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